

# SERVICE MANUAL

# imagePROGRAF iPF700



# Canon

## DU7-1183-000

JULY 2006  
REV. 0

## Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

## Corrections

This manual may contain technical inaccuracies or typographical errors due to improvements or changes in products. When changes occur in applicable products or in the contents of this manual, Canon will release technical information as the need arises. In the event of major changes in the contents of this manual over a long or short period, Canon will issue a new edition of this manual.

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## Caution

Use of this manual should be strictly supervised to avoid disclosure of confidential information.



# Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.
 Memo	Indicates an item intended to provide notes assisting the understanding of the topic in question.
 REF.	Indicates an item of reference assisting the understanding of the topic in question.
	Provides a description of a service mode.
	Provides a description of the nature of an error indication.

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

In the diagrams,  represents the path of mechanical drive; where a signal name accompanies the symbol, the arrow  indicates the direction of the electric signal.

The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low". (The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (\*) as in "DRMD\*" indicates that the DRMD signal goes on when '0'.

In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine."

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## Chapter 1

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# PRODUCT DESCRIPTION

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# Contents

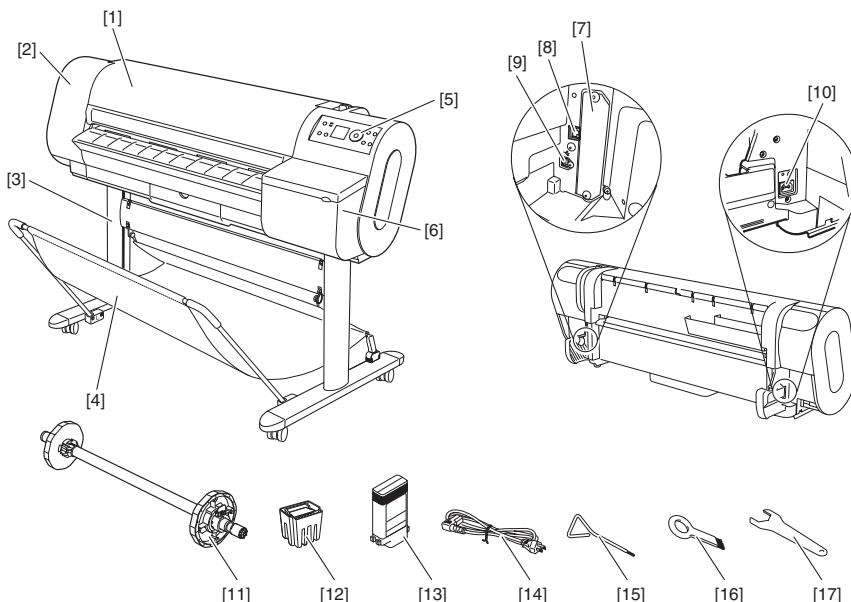
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## 1.1 Product Overview

### 1.1.1 Product Overview

This printer is a large-format printer that prints in a maximum width of 36 inches with high-speed photographic picture quality.

This printer is a desktop product that delivers its output on roll or cut media.



F-1-1

T-1-1

- |                           |                             |
|---------------------------|-----------------------------|
| [1] Top cover             | [10] Power supply connector |
| [2] Upper left cover      | [11] Roll holder set        |
| [3] Stand(option)         | [12] Print head             |
| [4] Output stacker        | [13] Ink Tank               |
| [5] Operation panel       | [14] Power cord             |
| [6] Ink tank cover        | [15] Hex key wernch         |
| [7] IEEE1394board(option) | [16] Cleaner brush          |
| [8] Ethernet connector    | [17] Stand assembly tool    |
| [9] USB port              |                             |

## 1.2 Features

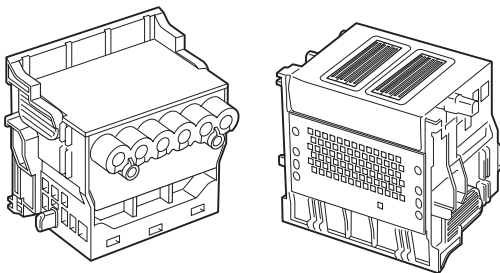
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### 1.2.1 Features

- Rear loading of roll media, making for compact, lightweight device geometry.
- Borderless four-side printing support (roll media) removes laborious cutting work, easing the job of creating posters to a significant degree.
- High resolutions of 2400 x 1200 dpi maximum, coupled with the exceptionally light-fast, water-proof and ozone-proof five-color pigment inks of Y, M, C, BK and MBK, deliver high-quality photographic picture quality.
- High-speed printing under bidirectional print control.
- Ink supply through tubing to a completely independent printhead and large-capacity ink tanks.
- Ready for roll media and cut media.
- Roll media pass in widths between 254 and 914.4 mm and in lengths up to 18 m.
- The cutter unit that mounts on the carriage allows paper to be cut automatically.
- Cut media are fed and ejected and ink tanks replaced all in an easy-to-access front panel operation.
- USB2.0 high-speed interface and 10Base-T/100Base-TX in standard support of a TCP/IP network, plus optional support of IEEE1394.

### 1.2.2 Printhead

The printhead that mounts on the carriage is an integrated six-color disposable printhead. It has 5,120 nozzles for MBK and 2,560 nozzles for each additional color arranged in a zigzag pattern. If print quality remains unimproved even after a specified cleaning operation, replace the printhead. Replacement about one year after the date of initial unpacking is also recommended.



F-1-2

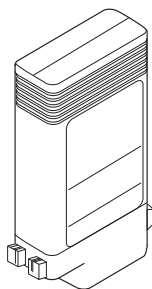
### 1.2.3 Ink tanks

Ink tanks are disposable.

An ink tank should be replaced when an ink tank replacement prompt message appears or when six months expire after the date of initial unpacking, whichever occurs earlier.

To install ink tanks, open the right cover of the printer. Ink tanks are furnished with a notch for preventing incorrect installation, which will allow the tanks to be installed at the position marked in the right color and nowhere else.

Ink tanks are available in the four dye ink colors of black, cyan, magenta and yellow and the pigment ink color of mat black.

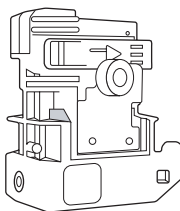


F-1-3

### 1.2.4 Cutter unit

The cutter unit that mounts on the carriage is disposable.

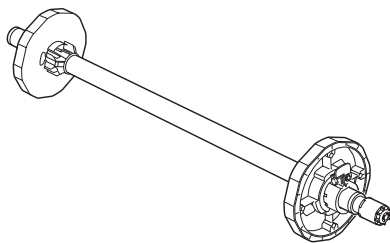
Replace the cutter unit when it gets dull.



F-1-4

1.2.5 Roll holder

The printer comes with a roll holder for paper tubes having an inside diameter of 2 inches as standard. It supports an optional roller holder for paper tubes having an inside diameter of 3 inches. Both roll holders clamp the paper tubes of roll media with an outside diameter of 150 mm or less from inside.

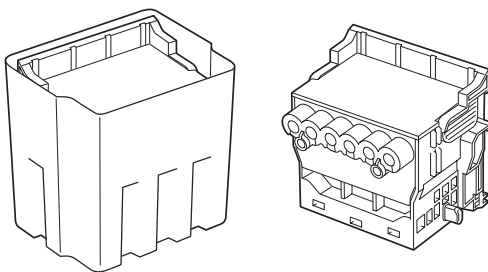


F-1-5

1.2.6 Expendables

a. Printhead

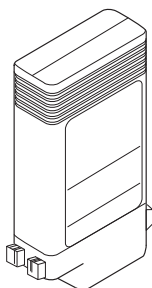
The expendable printhead is the same as the one that comes with the printer.



F-1-6

b. Ink tanks

The expendable ink tanks are available in six colors: mat black, black, cyan, magenta and yellow. They are the same the same as the ones that come with the printer. Usable for six months after unpacking.

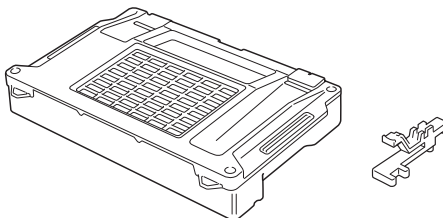


F-1-7



### c. Maintenance cartridge

The expendable maintenance cartridge is the same as the one that comes with the printer. The maintenance cartridge is furnished with a shaft cleaner.



F-1-8

## 1.3 Product Specifications

### 1.3.1 Product Specifications

<b>Type</b>	Bubble-jet printer (desktop type)
<b>Feeding system</b>	Roll media: Manual (Rear loading) Cut media: Paper tray (Front loading)
<b>Feeding capacity</b>	Roll media: 1 roll (up to 150 mm in outside diameter)/Option roll holder: Paper tubes with an inside diameter of 50.8 mm (2")/Option roll holder: Paper tubes with an inside diameter of 76.2 mm (3")/Cut media: 1 sheet
<b>Delivery method</b>	Face-up forward ejection
<b>Sheet delivery capability</b>	1 sheet (collected in a stacker)
<b>Cutter</b>	Auto-cutter with replaceable cartridges
<b>Type of media</b>	Plain paper, plain paper (bond paper), high-coloring plain paper, recycled plain paper, recycled coated paper, coated paper, thick coated paper, extra-thick coated paper, premium mat paper, colored coated paper (yellow), gloss photo paper, gloss photo paper <sup>2</sup> , gloss photo paper (thick), semigloss photo paper, semigloss photo paper <sup>2</sup> , semigloss photo paper (thick), synthetic paper, synthetic paper (glued), synthetic paper (with releasing glue), proof paper 2, newspaper proof paper 1, newspaper proof paper 2, newspaper proof paper 3, tracing paper, translucent mat films, clear films
<b>Supported thickness</b>	0.07 mm - 0.08mm
<b>Media size (Roll media)</b>	Width: 254 mm - 914.4 mm Length: 203.2 m - 18 m *1 Roll media up to 150 mm in outside diameter
<b>Media size (Cut sheet)</b>	Width: 203.2 mm - 917 mm Length: 203.2 mm - 1600 mm

<b>Printable area (Roll media)</b>	Bordered printing: Internal area, excluding 3-mm top, bottom, and left and right margins. Borderless printing: Internal area, excluding 0-mm top, bottom, and left and right margins. * The printable area may vary with each type of paper media used.
<b>Printable area (Cut sheet)</b>	Internal area, excluding a 3-mm top margin, 23-mm bottom margin and 3-mm left and right margins. *1 Borderless printing does not support cut media as yet. *2 The printable area may vary with each type of paper media used.
<b>Printing assurance area (Roll media)</b>	Internal area, excluding a 20-mm top margin, 5-mm bottom margin, and 7-mm left and right margins.
<b>Printing assurance area (Cut sheet)</b>	Internal area, excluding a 20-mm top margin, 5-mm bottom margin, and 23-mm left and right margins.
<b>Margins (Roll media)</b>	Roll media: 3 mm for top, bottom and left and right margins Borderless roll media: 0 mm for top, bottom and left and right margins
<b>Margins (Cut sheet)</b>	3-mm top margin, 23- mm bottom margin and 3- mm left and right margins * Borderless printing does not support cut media as yet.
<b>Emulation</b>	Not available.
<b>Interface</b>	USB2.0 Hi-Speed Network (10Base-T) IEEE1394 (option)
<b>Printhead/Ink Tank type</b>	Independent printhead and ink tanks
<b>Printhead</b>	[PF-02] Integrated six-color MB 5,120 nozzles, 2,560 nozzles for each additional color
<b>Ink tank</b>	[PFI-102] MBK, BK, C, M, Y Bundled: 90 ml Expendable: 130 ml
<b>Detection functions (Cover system)</b>	Head cap position sensor: Yes/ Cover open/closed sensor: Yes
<b>Detection functions (Ink passage system)</b>	Ink tank sensor: Yes/Remaining ink level sensor: Yes/ Maintenance cartridge sensor: Yes/Used ink tank full sensor: Yes/Printhead sensor: Yes
<b>Detection functions (Carriage system)</b>	Paper slip sensor: Yes/Carriage position sensor: Yes/Carriage home position sensor: Yes/Carriage cover open/closed sensor: Yes/Carriage temperature sensor: Yes
<b>Detection functions (Paper path system)</b>	Paper sensor: Yes/Leading and trailing paper end sensors: Yes/ Paper width sensor: Yes/Slant sensor: Yes/Paper release lever position sensor: Yes/Roll media bottom sensor: Yes/ Remaining roll media sensor: Yes/Feed roller rotation sensor: Yes
<b>Operating noise</b>	Sound pressure level: 50 dB (A) or less, operating; 35 dB or less, idle Acoustic power level: 6.3 Bels

<b>Operating environment</b>	Temperature: 15-30 oC Relative humidity: 10-80%RH (non-condensing)
<b>Print quality guaranteed environment</b>	Temperature: 15-30 oC Relative humidity: 10-80%RH
<b>Power supply</b>	AC 100 V - 240 V (50 Hz/60 Hz)
<b>Power consumption (Maximum)</b>	140 W or less
<b>Power consumption</b>	When idle in energy save mode (sleep mode) 100-120 V: 5.0 W or less (with IEEE1394 mounted, 8 W or less) 220-240 V: 6.0 W or less ((with IEEE1394 mounted, 9 W or less) When switched off (idle): 1 W or less
<b>Printer unit dimensions (WxDxH)</b>	1507 mm (width) x 871 mm (depth) x 1094 mm (height) (including the stand)
<b>Weight</b>	Approx. 62 kg (including the stand)

1.4 Detailed Specifications

1.4.1 Print speeds and print directions

T-1-2

Mediatype	Prioritized picture quality	Print quality	Number of passes	Direction (*1)	Resolution
Plain paper Plain paper (bond paper) Plain paper (high-coloring)	Photographs and illustrations	Fast	1 pass	Bidirectional	1200 x 1200 dpi
		Standard	2 passes	Bidirectional	1200 x 1200 dpi
		Fine	4 passes	Bidirectional	1200 x 1200 dpi
	Line drawings and text	Fast (*2)	1 pass	Bidirectional	1200 x 1200 dpi
			1 pass	Bidirectional	1200 x 1200 dpi
		Standard	1 pass	Bidirectional	1200 x 1200 dpi
		Fine (*2)	2 passes	Bidirectional	1200 x 1200 dpi
			2 passes	Bidirectional	1200 x 1200 dpi
	Office characters	Standard (*3)	1 pass	Bidirectional	1200 x 1200 dpi
			2 passes	Bidirectional	1200 x 1200 dpi
Coated paper Dedicated high-quality paper Thick coated paper	Photographs and illustrations	Standard	4 passes	Bidirectional	1200 x 1200 dpi
		Fine	8 passes	Bidirectional	2400 x 1200 dpi
		Maximum	12 passes	Bidirectional	2400 x 1200 dpi
	Line drawings and text	Fast (*2)	1 pass	Bidirectional	1200 x 1200 dpi
			1 pass	Bidirectional	1200 x 1200 dpi
		Standard	2 passes	Bidirectional	1200 x 1200 dpi
		Fine (* 2)	4 passes	Bidirectional	1200 x 1200 dpi
			4 passes	Bidirectional	1200 x 1200 dpi
Premium mat paper Mat photopaper	Photographs and illustrations	Standard	6 passes	Bidirectional	1200 x 1200 dpi
		Fine	8 passes	Bidirectional	2400 x 1200 dpi
		Maximum	16 passes	Bidirectional	2400 x 1200 dpi
	Line drawings and text	Fast (*2)	1 pass	Bidirectional	1200 x 1200 dpi
			1 pass	Bidirectional	1200 x 1200 dpi
		Standard	2 passes	Bidirectional	1200 x 1200 dpi
		Fine (* 2)	4 passes	Bidirectional	1200 x 1200 dpi
			4 passes	Bidirectional	1200 x 1200 dpi
Gloss photo paper, gloss photo paper 2 Semigloss photo paper, semigloss photo paper 2 Gloss photo paper (thick) Semigloss photo paper (thick) Gloss paper, pro photopaper Super photopaper Super photopaper (silky) Proof paper 2 Synthetic paper (unglued) Synthetic paper (glued)	Photographs and illustrations	Standard	6 passes	Bidirectional	1200 x 1200 dpi
		Fine	8 passes	Bidirectional	2400 x 1200 dpi
		Maximum	16 passes	Bidirectional	2400 x 1200 dpi

Mediatype	Prioritized picture quality	Print quality	Number of passes	Direction (*1)	Resolution
Tracing paper(CAD) translucent mat films(CAD)	Line drawings and text	Fast (*2)	1 pass	Bidirectional	1200 x 1200 dpi
			1 pass	Bidirectional	1200 x 1200 dpi
		Standard	2 passes	Bidirectional	1200 x 1200 dpi
		Fine (* 2)	4 passes	Bidirectional	1200 x 1200 dpi
			4 passes	Bidirectional	1200 x 1200 dpi

\*1

Unidirectional printing may be automatically selected by the print engine according to the type of image to be printed (such as a graphic image). Unidirectional printing can also be optionally selected from the printer driver.

\*2

Optionally selectable from the printer driver.

\*3

The printer drives an optimal pass count automatically to suit print data.

## 1.4.2 Interface specifications

### a. [USB] (Standard)

#### (1) Interface Type

USB 2.0, full speed (12 Mbps/sec), high Speed (480 Mbps/sec)

#### (2) Methods of data transfer

Controlled transfer

Bulk transfer

#### (3) Signal level

Compliant with the USB standard.

#### (4) Interface cable

Twisted-pair shielded cable, 5.0 m or shorter

Compliant with the USB standard.

Wire AWG No.28, data line pair (AWG: American Wire Gauge)

AWG No.20 to No.28, distribution line pair

#### (5) Interface connector

Printer side: USB standard, Series B receptacle

Cable side: USB standard, Series B plug

### b. [Network] (Standard)

#### (1) Interface Type

IEEE802.3-compliant interface

#### (2) Data transfer method

10Base-T/100Base-TX

#### (3) Signal level

Input: Threshold.

10Base-T: Max +585mV, min +300mV

100Base-TX: Turn-on +1000mV diff pk-pk, turn-off +200mV diff pk-pk

Output:

10Base-T: +2.2V - +2.8V

100Base-TX: +0.95V - +1.05V

#### (4) Interface cable

Category 5 (UTP or FTP) cable, 100 m or shorter

Compliant with the ANSI/EIA/TIA-568A or ANSI/EIA/TIA-568B standard.

#### (5) Interface connector

Printer side: IEEE802.3 and ANSI X3.263-compliant, ISO/IEC60603-7 standard

**c. [IEEE1394] (option)**

**(1) Interface Type**

IEEE 1394-1995, P1394a (Version 2.0)-compliant interface

**(2) Method of data transfer**

Asynchronous transfer

**(3) Signal levels**

Input:

Differential input voltage: +173mV - +260mV during S100 arbitration

+142mV - +260mV, receiving data

+171mV - +262mV during S200 arbitration

+132mV - +260mV, receiving data

+168mV - +265mV during S400 arbitration

+118mV - +260mV, receiving data

Output :

Differential output voltage: +172mV - +265mV

**(4) Interface cable**

Twisted-pair shielded cable, 4.5 mm or shorter.

Compliant with the IEEE1394-1995 or (Version 2.0) standard

**(5) Interface connector**

Printer side: IEEE1394-compliant, 6-pin connector (socket)

Cable side: IEEE1394-compliant, 6-pin connector (plug)

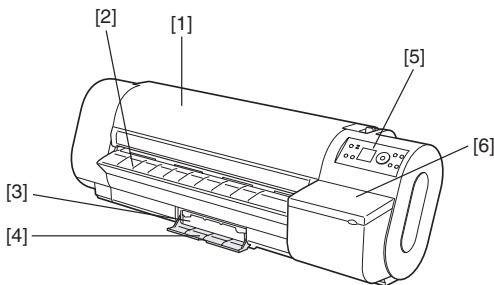
Cable side: Compliant with the ANSI/EIA/TIA-568A or ANSI/EIA/TIA-568B standard, Type RJ-45.

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## 1.5 Names and Functions of Components

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### 1.5.1 Printer front panel



F-1-9

**[1] Top cover**

Open this cover to mount the printhead, load paper and clear jams inside the printer.

**[2] Eject guide**

Supports ejected paper to keep it from floating up.

**[3] Maintenance cartridge**

Blots excess inks.

**[4] Maintenance cartridge cover**

Open this cover to replace the maintenance cartridge.

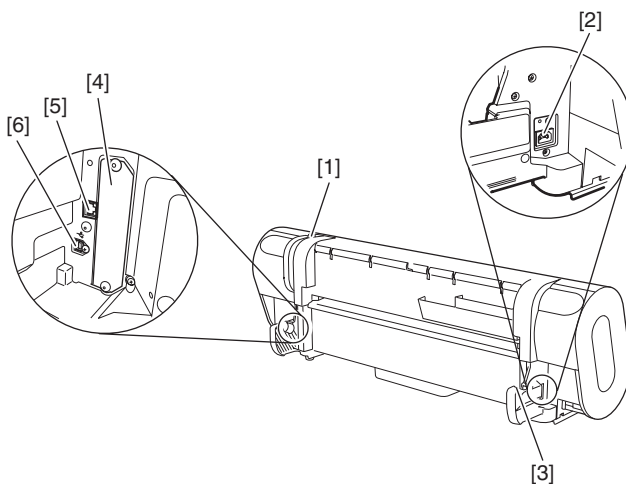
**[5] Operation panel**

Operate the printer or check its status from this panel.

**[6] Ink tanks cover**

Open this cover to replace ink tanks.

## 1.5.2 Printer rear panel



F-1-10

**[1] Release lever**

Releases the paper retainer. Press this lever rearward to load paper or clean the interiors of the printer.

**[2] Power connector**

Connect the power cord to this connector.

**[3] Roller holder slot**

Set the roll holder in this guide slot.

**[4] Expansion PCB slot**

Mount an IEEE1394 (Fire Wire) expansion PCB on this slot.

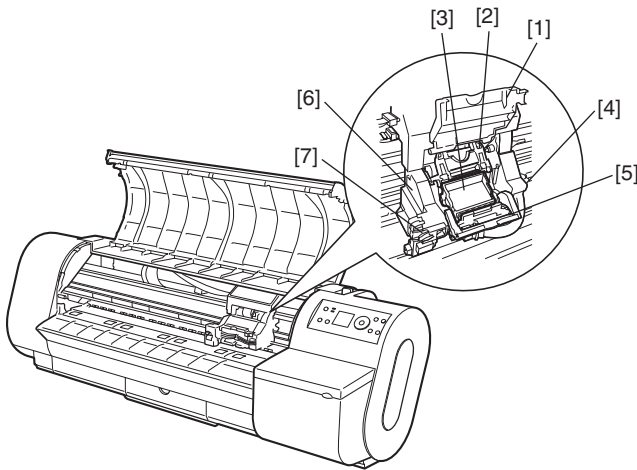
**[5] USB port**

Connect the USB cable to this port. Ready for the USB2.0 hi-speed mode.

**[6] Ethernet connector**

Connect the Ethernet cable to this connector.

### 1.5.3 Carriage



F-1-11

**[1] Carriage cover**

Protects the carriage.

**[2] Printhead fixer cover**

Clamps the printhead.

**[3] Printhead**

A key component that houses nozzles.

**[4] Shaft cleaner**

Keeps the carriage shaft clean.

**[5] Printhead fixer lever**

Locks the printhead fixer cover.

**[6] Slant adjustment lever**

Fine-adjusts slants in ruled lines during printing.

**[7] Cutter unit**

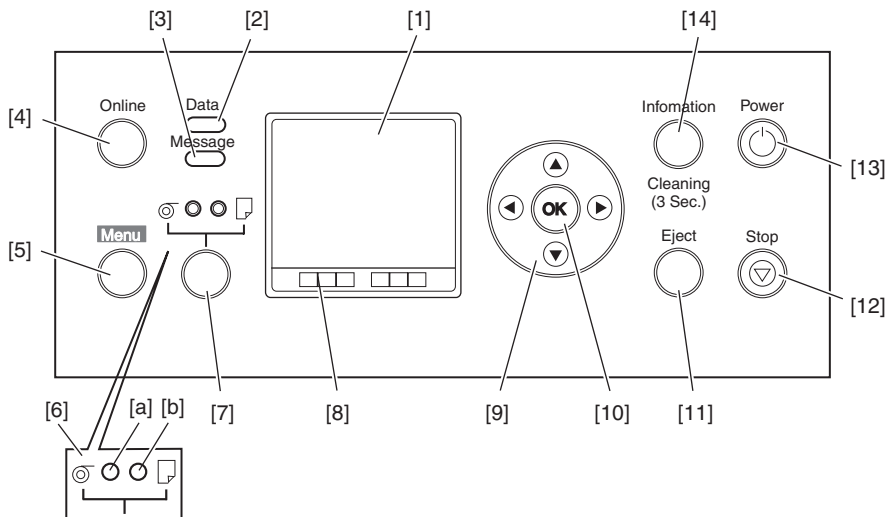
A curved cutting edge that cuts paper automatically. It is tucked inside when cutting is not performed.



## 1.6 Basic Operation

### 1.6.1 Operation panel

The functions of the keys and meanings of LED indications on the operation panel are described below.



F-1-12

#### [1] Display

Displays the printer menu, status or messages.

#### [2] Data lamp (green)

"Blinking" The printer is receiving or processing a print job when it is printing.

The printer has suspended a print job or is receiving firmware data when it is not printing.

"Off" No print job is available.

#### [3] Message lamp (orange)

"Lit continuously" A warning message is on display.

"Blinking" An error message is on display.

"Off" The printer is normal or is powered off.

#### [4] Online key

Switches the printer between two alternative modes: online and offline.

"Lit continuously" The printer is in online mode. Lights green.

"Off" The printer is in offline mode.

#### [5] Menu key

Displays a printer main menu.

#### [6] Paper source selector

[a] Roll media lamp (green)

"Lit continuously" Roll media have been selected as a paper source.

"Off" Cut media have been selected as a paper source.

[b] Cut media lamp (green)

"Lit continuously" Cut media have been selected as a paper source.

"Off" Roll media have been selected as a paper source.

#### [7] Paper source selector key

Toggles a paper source between roll and cut media each time the key is pressed.

#### [8] Color labels

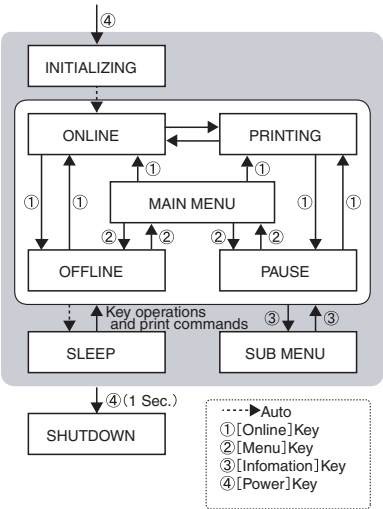
Colors and names of ink tanks associated with the remaining ink levels appearing on the display.

[9] ▲ ▼ ◀ ▶ **Keys**  
[Menu mode]

- "▲ key" Opens the menu one level above.
  - "▼ key" Opens the menu one level lower.
  - "◀ key" Displays the previous action or setting.
  - "▶ key" Displays the next action or setting.
- [Offline mode]
- "▲ key" Feeds roll media manually in the direction opposite to the direction in which paper is ejected.
  - "▶ key" Feeds roll media manually.
- [10] OK key**  
Sets or runs a selected action or value when the printer is in menu mode.
- [11] eject key**  
Executing menu and ejects paper.
- [12] Stop key**  
Quits a processing job.
- [13] Power key**  
Switches the power to the printer on and off.
- [14] Information key**  
Displays a printer submenu. Information about the inks and paper displays each time this key is pressed.  
Hold this key for 3 seconds to clean the printhead.

1.6.2 Printer state transitions

The different states of the printer and their transitions caused by pressing the relevant keys are shown below.



F-1-13

### 1.6.3 Main menu

This printer supports a main menu that offers an organized clue to opening a maintenance menu for adjusting the discharge position of each nozzle, cleaning the printhead and so on, a print setup menu for setting the auto-cutting feature, the ink drying time and so on, a parameters menu for selecting a message display language and so on, and more..

#### **a. Working with the main menu**

(1) How to enter the main menu

While the printer is in offline mode, press the [Menu] key to enter the main menu.

(2) How to exit the main menu

To exit the main menu, press the [Online] key.

(3) Functions of keys on the main menu

-To select menu choices and settings: [◀] key or [▶] key

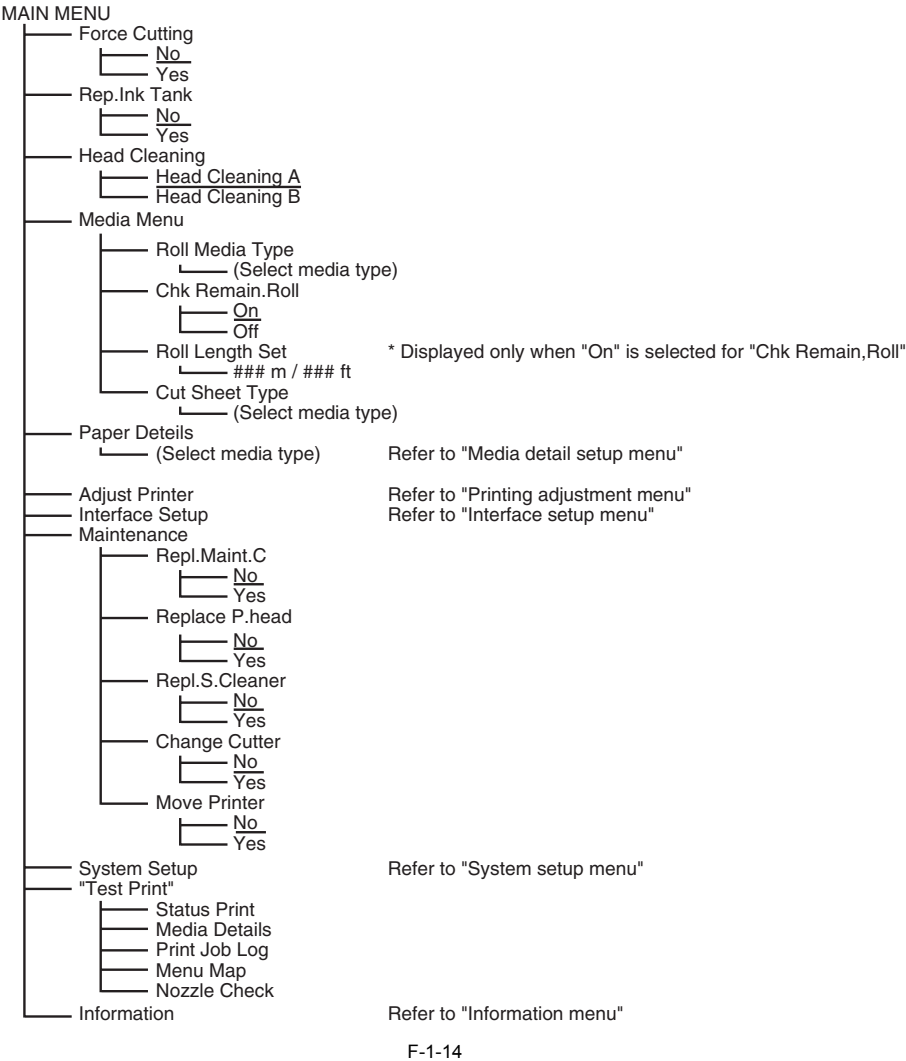
-To enter the menu one level below: [▼] key

-To enter the menu one level above: [▲] key

-To accept menu choices or settings: [OK] key

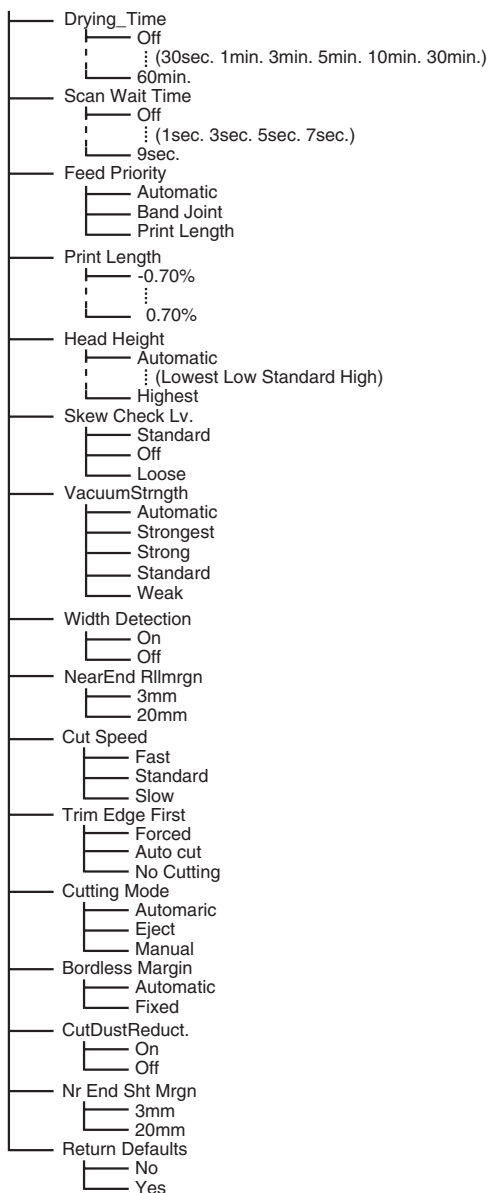
b. Main menu List

The hierarchy and settings of the main menus are described below.

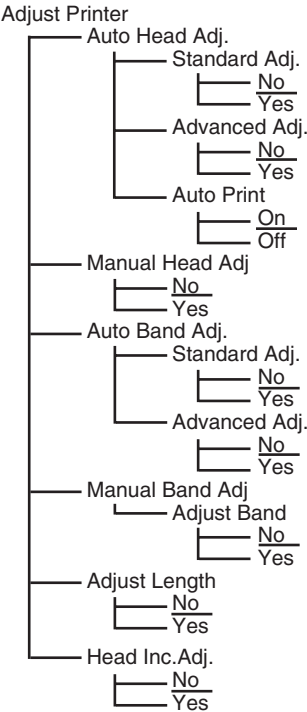


## Paper Details MENU

## Paper Details

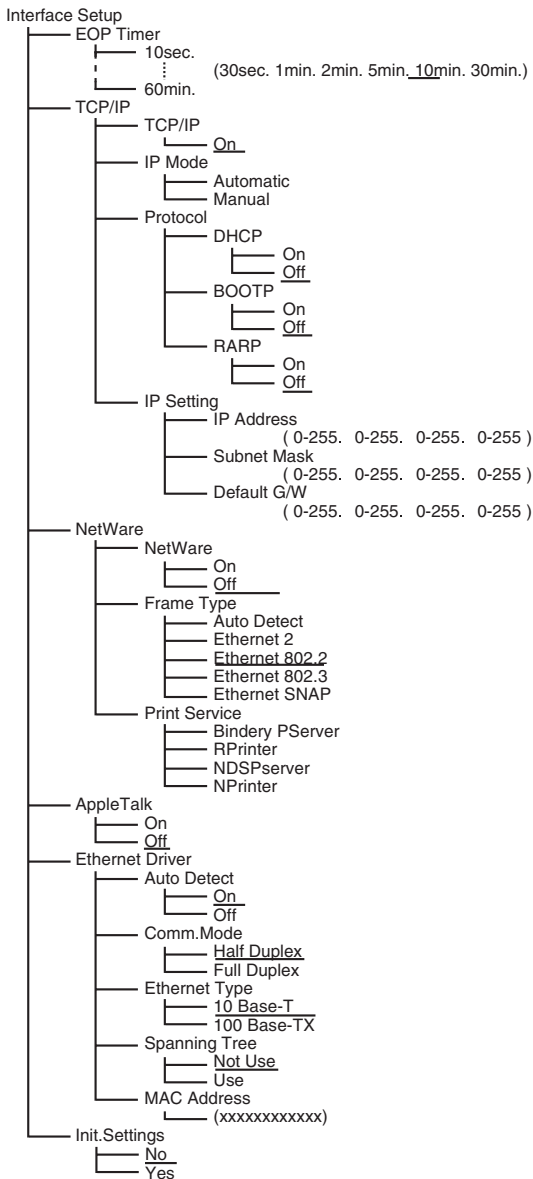


Adjust Printer Menu

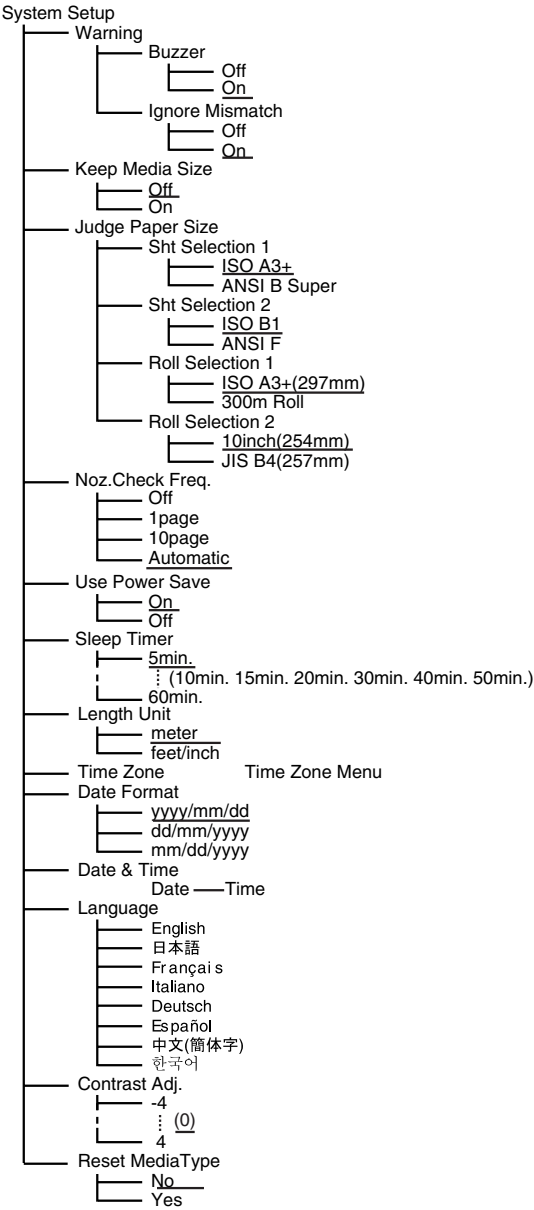


F-1-16

## Interface Setup Menu



System Setup Menu





Time Zone

Time Zone

0 :	London (GMT)
+1 :	Paris,Rome
+2 :	Athens,Cairo
+3 :	Moscow
+4 :	Eerevan,Baku
+5 :	Islamabad
+6 :	Dacca
+7 :	Bangkok
+8 :	Hong Kong
+9 :	Tokyo,Seoul
+10 :	Canberra
+11 :	NewCaledonia
+12 :	Wellington
-12 :	Eniwetok
-11 :	Midway is.
-10 :	Hawaii (AHST)
-9 :	Alaska (AKST)
-8 :	Oregon (PST)
-7 :	Arizona (MST)
-6 :	Texas (CST)
-5 :	NewYork (EST)
-4 :	Santiago
-3 :	Buenos Aires
-2 :	Central Atlantic Ocean
-1 :	Cape Verde

GMT : Greenwich Mean Time  
AHST : Alaska-Hawaii Std Time  
AKST : Alaska Standard Time  
PST : Pacific Std Time  
MST : Mountain Standard Time  
CST : Central Std Time  
EST : Eastern Standard Time

F-1-19

Information Menu

Information

System Info	
Error His.Info	
	1 xxxxx
	2 xxxxx
Job His.Info	
	Job 1-3
	Document Name
	User Name
	Page Count
	Job Status
	Print Start Time
	Print End Time
	Print Time
	Print Size
	Media Type
	Interface
	Coverage

F-1-20

## 1.7 Safety and Precautions

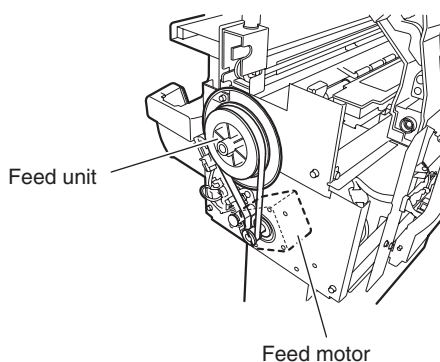
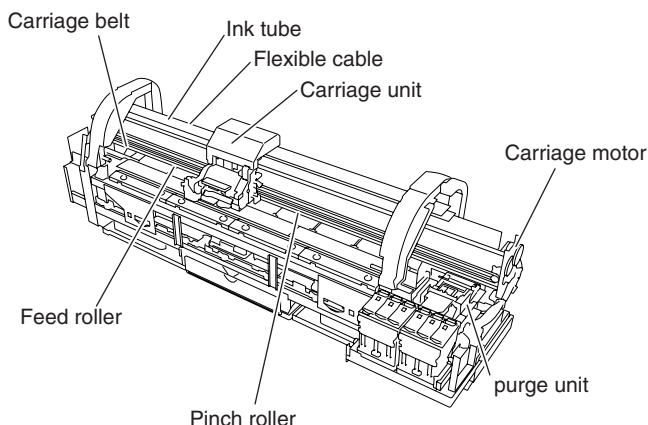
### 1.7.1 Safety Precautions

#### 1.7.1.1 Moving parts of the printer

Be careful not to get your hairs, clothing, accessories or any other objects caught in the moving parts of the printer.

The moving parts of the printer include the carriage unit, carriage belt, ink tube, flexible cable and feed motor driven by the carriage motor and the feed and pinch rollers driven by the feed motor and the purge unit driven by the purge motor.

To assure safety, the printer locks the top cover from opening while it is printing. When the top cover is opened while the printer is in online or offline mode, the driving power to the carriage and feed motors is shut down.



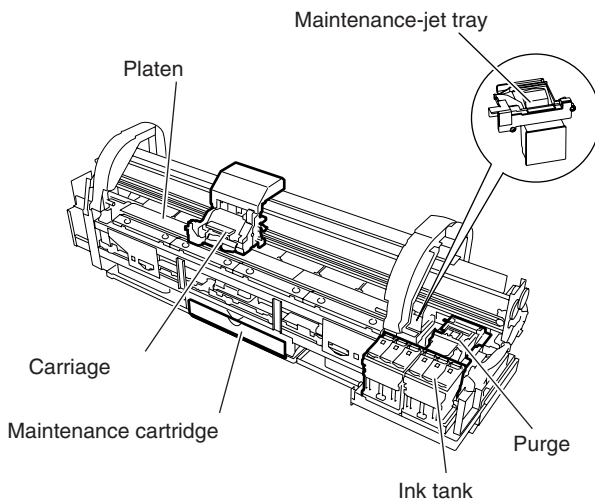
F-1-21

### 1.7.1.2 Ink adhesion

#### a. Ink passage

Be careful not to touch the ink passage in the printer to get the printer being serviced, workbench, your hands and clothes and so on smeared by the ink.

The ink passage comprises the ink tank unit, carriage unit, purge unit, maintenance cartridge unit and the ink tubes that interconnect the separate parts.



F-1-22



Inks contain an organic solvent, which is not harmful to the human body, though.

When an ink comes into the hands or any other part of your body, wash it away thoroughly. Be careful not to lick an ink or allow it to come into contact with your eyes.

In the event of eye contact, immediately wash with water thoroughly and obtain medical attention.

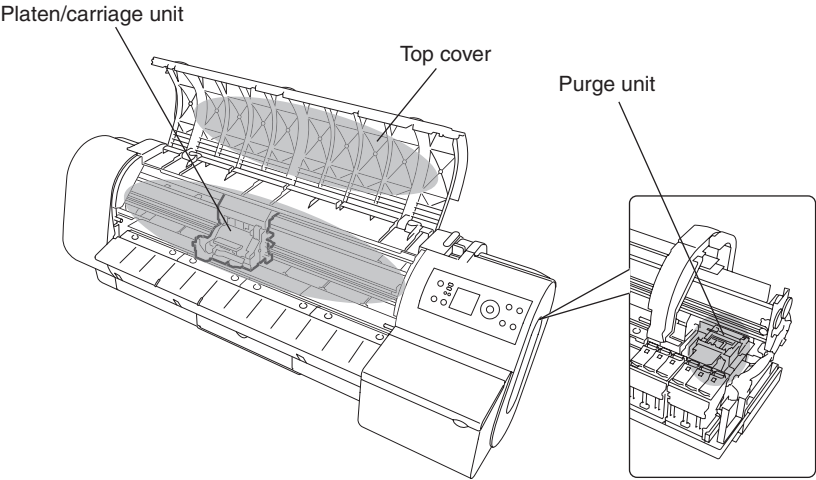
Also, if you have swallowed an ink in a large quantity by mistake, obtain medical attention immediately.

Inks contain a pigment and would not come off once they adhere to clothing.

**b. Ink mists**

As the printhead jets an ink against paper to print, traces of ink mists floating during printing or springing back from the paper are produced in the print station. Such ink mists are collected by mist collection air flow into the printer. The uncollected portion of ink mists could smear the platen unit, carriage unit, exterior surfaces and the purge unit, and their surrounding areas.

Such smears could in turn spoil the paper or your hands or clothes during servicing. Wipe such smears off with a soft cloth moistened with water and wrung carefully.



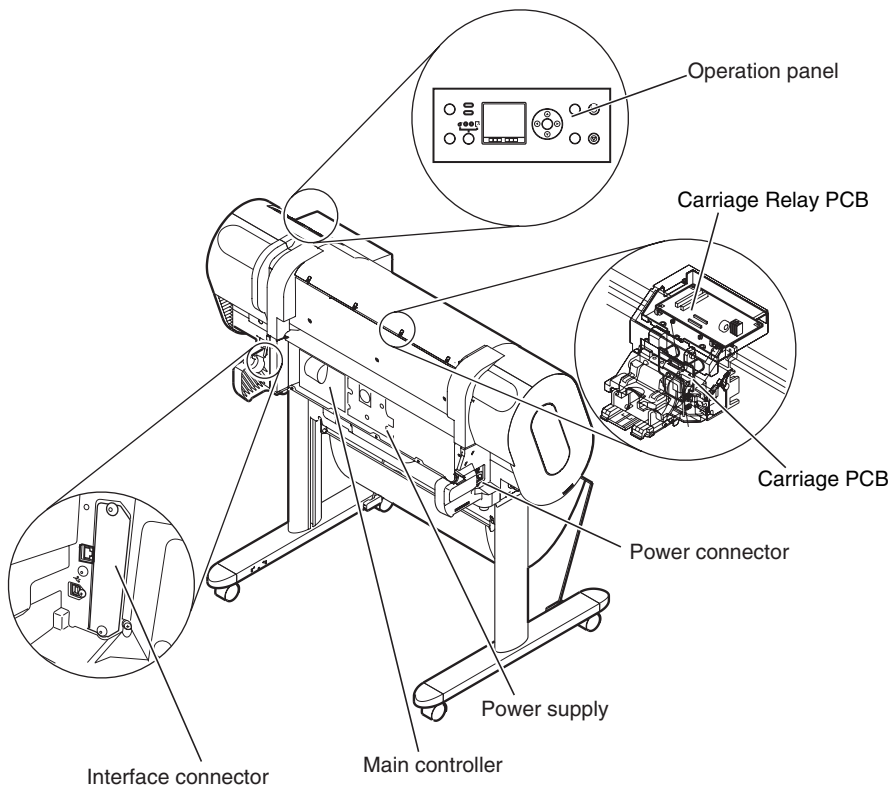
F-1-23

### 1.7.1.3 Live parts of the printer

Any electrical portion of the printer becomes live when AC power is supplied to it.

The main controller, power supply and interface connector are found on the left rear side of the printer, with the operation panel being located on the upper right cover.

In checking printer operations with the cover open during servicing, take maximum care to avoid electrical shocks and not to cause damage to electrical components.



F-1-24

## 1.7.2 Other Precautions

### 1.7.2.1 Printhead

#### a. Handling the printhead

Do not unpack the printhead until it is ready for immediate use.

When mounting the printhead on the printer, remove protective caps 1 and 2 in this order by holding them by the lugs. To prevent possible damage to the nozzle section, do not replace protective cap 2 on the printhead once it has been removed.

After the printhead is removed of its protective caps, assemble it into the printer promptly to prevent the nozzles from being clogged by foreign matter adhering to the printhead to or a dried ink.

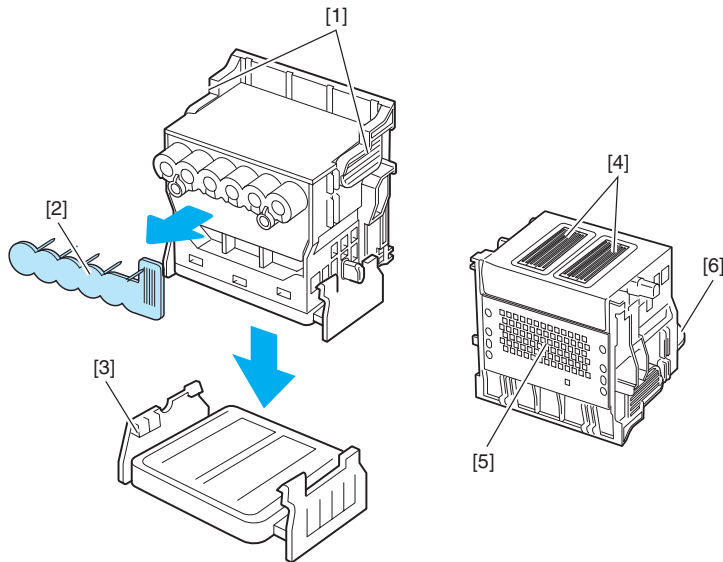
Depress the printhead fixer lever until it clicks into position.

To prevent the problems of nozzle clogging and poor ink suction that may be caused by adhering foreign matter, never touch the nozzle section and the ink port of the printhead or never wipe their surfaces with tissue paper or the like. Remember also to keep hands of the electrode section.

The printhead cannot be disassembled/reassembled or rinsed in water.

#### Memo:

A clogged nozzle or poorly sucked ink could result in a print defect, such as a periodic print void or poor coloring. If these problems persist even after cleaning, replace the printhead with a new one.



F-1-25

T-1-3

- |                      |                       |
|----------------------|-----------------------|
| [1] Lugs             | [4] Nozzle section    |
| [2] Protective cap 1 | [5] Electrode section |
| [3] Protective cap 2 | [6] Ink port          |

**b. Capping action**

The printer performs a capping action at the end of printing or when it stands by in the wake of an error occurrence, to protect the printhead and prevent ink leaks.

If the printer has been powered off by inadvertently disconnecting the power cord from the wall outlet, reconnect the power cord to the wall out and turn on the power key. When the printer starts up successfully to enter online or offline mode, turn off the power key.

---



Failure to perform a capping action successfully could result in problems, such as printhead nozzles clogged by a dried ink or inks leaking from the printhead.

---

**c. When leaving the printer of service**

Even when the printer is out of service, store it with the printhead mounted on it.

---



Leaving the printer with the printhead removed from it could allow foreign matter to adhere to the printhead or dry an ink, resulting in clogged nozzles to cause print defects.

If the printhead is drained of inks for shipping purposes even though it is kept mounted on the printer, the nozzles could dry, resulting in print defects.

---

**d. Ink conductivity**

The inks used are conductive. If an ink is found to leak to the mechanical assembly, wipe it off with a soft cloth moistened with water and wrung thoroughly. If an ink is found to leak to the electrical assembly, blot it with tissue paper or the like and wipe it off thoroughly. If wiping off a leaking ink thoroughly is difficult, replace with a new component.

---



Energizing the printer with the electrical assembly being wetted with an ink could cause damage to it. Never connect the power cord to the wall outlet while the electrical assembly is wet with an ink.

---

### 1.7.2.2 Ink tanks

#### a. Opening ink tanks

Do not unpack ink tanks until they are ready for immediate use.

When placing an ink tank in position, shake it slowly seven to eight times before opening it. Without shaking, the ingredients of the ink might settle, resulting in degraded print quality.

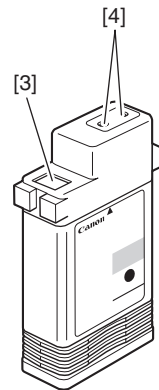
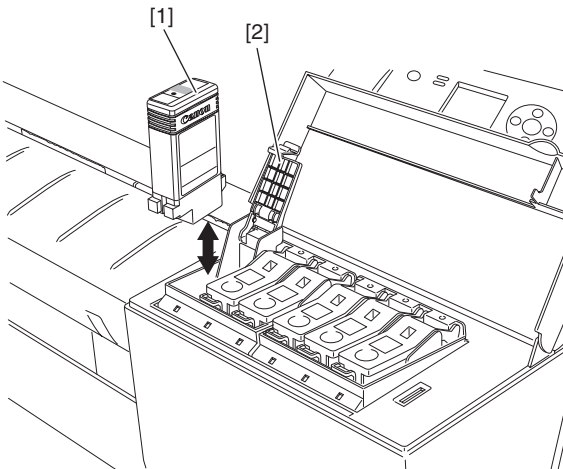
Once an ink tank is opened, mount it in the printer promptly to prevent any foreign matter from sticking to the ink port.

#### b. Handling ink tanks

To prevent foreign matter from infiltrating the ink passage to impair ink suction or print quality, never touch contact [3] or ink port [4] of ink tank [1].

Depressing ink tank cover [2] of the printer would cause a needle to pierce the ink port, linking the ink passage of linking ink tank [1] to the printer.

Do not lift up and down ink tank cover [2] except for purposes other than replacing ink tank [1].



F-1-26



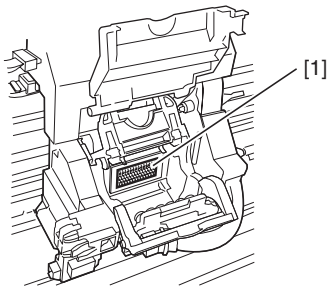
### 1.7.2.3 Dealing with the printer

#### a. Protecting against electrostatic breakdowns

Pieces of clothing rubbing each other could build up static electricity, producing static charges in human bodies to cause harm to an electrical component or corrupt its electrical characteristics.

You are strongly advised never to touch the printhead contact of the carriage.

[1]Contact with the printhead

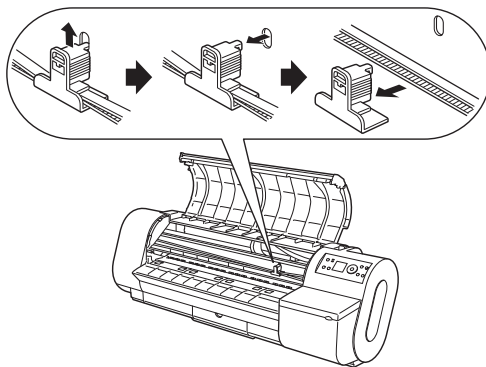


F-1-27

#### b. Securing the carriage in position

The carriage is mechanically locked by the lock arm in the purge unit at the same time as the printhead caps itself at the end of printing.

Before shipping the printer, secure the carriage at the home position with a belt stopper so the carriage won't be damaged when it is released from the lock arm or inks won't leak during transit.



F-1-28

#### c. Handling maintenance cartridges

Be careful in unloading a maintenance cartridge from the printer not to keep the used ink from spilling over.

#### d. Refilling the printer with inks

If the printer has been purged of inks through an automatic or manual ink drain for disassembly/reassembly or for reshipping, refill the printer with inks as soon as possible after the completion of the work.

If residual inks in the printer dry, they could seize mechanical components, with the result of malfunctioning.

## 1.7.3 Precautions When Servicing Printer

### 1.7.3.1 Tips on data stored in the printer

This printer memorizes the print length, how many times tanks have been replaced, how long the carriage has been driven, how many times the printhead has been cleaned, how many times the cutter has been actuated and so forth, and stores such statistics in service mode counters in EEPROM on the main controller.

The counters provide valuable information to help determine the status of printer utilization.

The counters may be printed out in service mode or displayed for visual verification.

Take notice of these instructions when servicing the printer:

#### a. Repairing/replacing the PCB

Follow a defined replacement routine to replace the main controller.

#### b. After replacement of the carriage unit

The carriage drive duration is a piece of information derived from the carriage unit. When the carriage unit has been replaced, run INITIALIZE > CARRIAGE in service mode to initialize (clear) the carriage drive duration information.

#### c. After replacement of the purge unit

The cleaning count is a piece of information derived from the purge unit. When the purge unit has been replaced, run INITIALIZE > PURGE in service mode to initialize (clear) the cleaning count information.

---

#### See:

For instructions on how to replace the main controller, see Disassembly/Reassembly > Tips on Disassembly/Reassembly > PCB.

---



Counter information would not be available for viewing once it is initialized (cleared). You are warned not to perform initialization before you view the counters.

The counters are not writable from the operation panel.

---

### 1.7.3.2 Confirming the Firmware Version

The main controller has firmware downloaded in it.

When the main controller has been replaced, make sure that the latest version of firmware is installed in it.

If not, upgrade the firmware to the latest version.

---

#### See:

For instructions on how to upgrade the firmware, see Troubleshooting > Upgrade.

---

### 1.7.3.3 Precautions against Static Electricity

Pieces of clothing rubbing each other could build up static electricity, producing static charges in human bodies to cause harm to an electrical component or corrupt its electrical characteristics.

Before disassembling the printer for servicing, touch a positively grounded metallic object to neutralize static charges in your body.

### 1.7.3.4 Precautions for Disassembly/Reassembly

Disassembly/reassembly tips can be found in Disassembly/Reassembly.

### 1.7.3.5 Self-diagnostic Feature

The printer comes with built-in self-diagnostics to analyze hardware malfunctions as they occur. Displays and LED indications provide a visual identification of the results of self-diagnostics. For more details, see the error indication section of Error Codes.

### 1.7.3.6 Disposing of a lithium battery

The main controller PCB mounted in the printer has one lithium battery to back up various data.

---



The lithium battery could explode if it is replaced with a wrong type of battery. Dispose of a used battery as recommended in the manual.

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## Chapter 2

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# TECHNICAL REFERENCE

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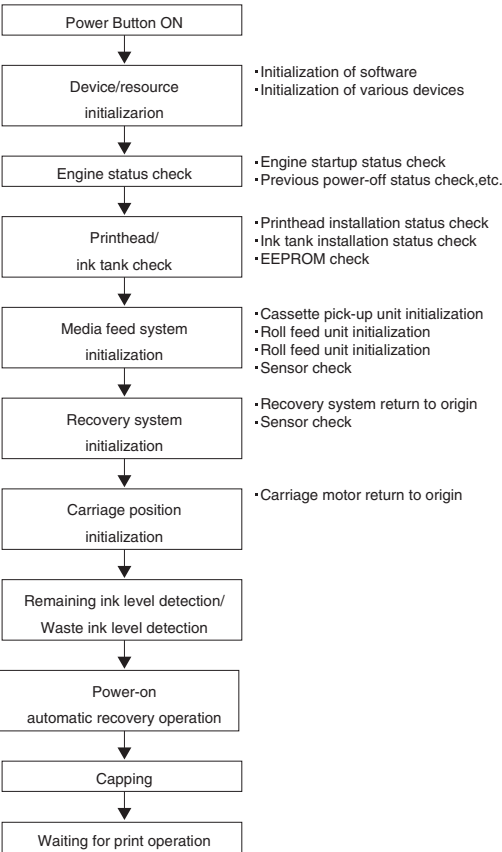
2.1.2 Print Driving

At printing, print signals and control signals are output to the printhead via the carriage relay PCB and Head relay PCB to discharge inks from the nozzle assembly.  
The printhead six trains of nozzles arranged in a zigzag pattern.  
This printer uses only one printhead.  
(Installed from left to right: C, M, Y, MBk, MBk and Bk)  
Two kinds of print signals are transferred to each nozzle train according to the data transfer clock and the data pulse timing: even-numbered nozzle data and odd-numbered nozzle data.  
Drive control signals fall into two types: heat enable signals and subheat enable signal. The heat enable signal allows inks to be discharged from the nozzles, whereas the subheat enable signal heats the head to an optimal temperature to keep the rate of ink discharge constant.

2.2 Firmware

2.2.1 Operation Sequence at Power-on

The sequence of printer operations, from power-on to transition to online mode, is flowcharted below.  
\* This flowchart does not include the times spent supply inks and cleaning after leaving the printer for extended periods of time.



F-2-2

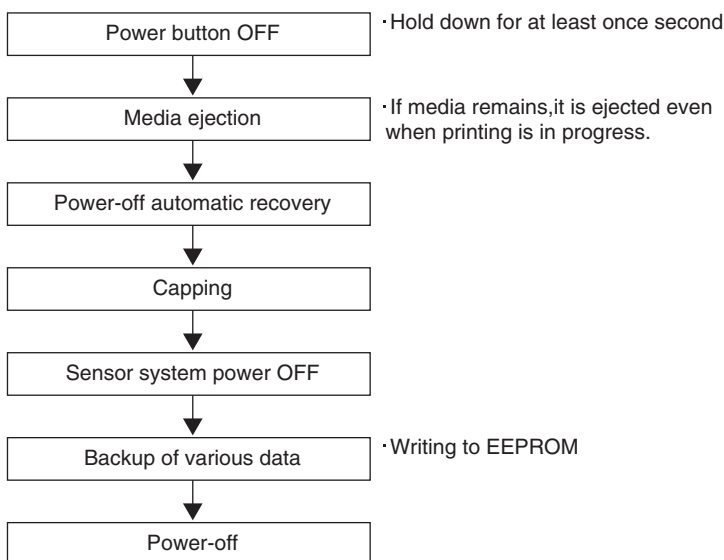


## 2.2.2 Operation Sequence at Power-off

Turning off the power switch cuts off the drive voltage supply, launching a firmware power-off sequence as shown below.



If the power cord is disconnected from the wall outlet or the top cover or any other cover is opened, the printer cancels the ongoing operation and shuts down immediately. Since printhead capping may or may not have been carried out properly, reconnect the power cord to the wall out and turn on the power switch. Making sure that the printer has entered online mode, turn off the power switch.



F-2-3

## 2.2.3 Print Control

### a. Print modes

Print methods, such as carriage and paper feed operation, are varied according to the media type, print quality, kind of print data and so forth to achieve high-quality high-speed print free from blurring and uneven density. Because each color prints in up to 16 passes according to the print quality requirement for a print mode, uneven density problems caused by variations in the rate of discharge among different nozzles are eliminated. Deferred print timings do not allow a new ink to overprint the preceding ink until the preceding ink has virtually fixed, thereby reducing the chances of blurred printing.

Different operations take place even in the same print mode according to the paper setting of the print driver.

#### (1) Draft mode

Imaging data are thinned out to print in one or two passes per band (equivalent of the length of a nozzle). Select Draft as a print quality setting of the print driver to enable draft mode.

#### (2) Standard mode

Imaging data prints in one to six (one, two, four or six) passes per band (equivalent of the length of a nozzle).  
Select Standard as a print quality setting of the print driver to enable standard mode.

**(3) High quality mode**

Imaging data prints in two, four or eight passes per band.  
Select High as a print quality setting of the print driver to enable high quality mode.

**(4) Highest quality mode**

Imaging data prints in eight or 16 passes per band.  
Select Highest as a print quality setting of the print driver to enable highest quality mode.

**Print Mode List**

T-2-1

Media Type	Print Priority	Print Quality	Print-pass	Printing direction(*1)	Print resolution
Plain Paper Plain Paper(High Quality) Plain Paper(High Grade)	Image	Draft	1pass	Bi-directional	1200x1200dpi
		Standard	2pass	Bi-directional	1200x1200dpi
		High	4pass	Bi-directional	1200x1200dpi
	Line Drawing/ Text	Draft (*2)	1pass	Bi-directional	1200x1200dpi
			1pass	Bi-directional	1200x1200dpi
		Standard	1pass	Bi-directional	1200x1200dpi
			2pass	Bi-directional	1200x1200dpi
		High (*2)	2pass	Bi-directional	1200x1200dpi
			2pass	Bi-directional	1200x1200dpi
	Office Document	Standard (*3)	1pass	Bi-directional	1200x1200dpi
			2pass	Bi-directional	1200x1200dpi
Coated Paper High Resolution Paper Heavyweight Coated Paper	Image	Standard	4pass	Bi-directional	1200x1200dpi
		High	8pass	Bi-directional	2400x1200dpi
		Highest	12pass	Bi-directional	2400x1200dpi
	Line Drawing/ Text	Draft (*2)	1pass	Bi-directional	1200x1200dpi
			1pass	Bi-directional	1200x1200dpi
		Standard	2pass	Bi-directional	1200x1200dpi
			4pass	Bi-directional	1200x1200dpi
		High (*2)	4pass	Bi-directional	1200x1200dpi
			4pass	Bi-directional	1200x1200dpi
Premium Matte Paper Matte photo Paper	Image	Standard	6pass	Bi-directional	1200x1200dpi
		High	8pass	Bi-directional	2400x1200dpi
		Highest	16pass	Bi-directional	2400x1200dpi
	Line Drawing/ Text	Draft (*2)	1pass	Bi-directional	1200x1200dpi
			1pass	Bi-directional	1200x1200dpi
		Standard	2pass	Bi-directional	1200x1200dpi
			4pass	Bi-directional	1200x1200dpi
		High (*2)	4pass	Bi-directional	1200x1200dpi
			4pass	Bi-directional	1200x1200dpi

Media Type	Print Priority	Print Quality	Print-pass	Printing direction(*1)	Print resolution
Glossy Photo Paper	Image	Standard	6pass	Bi-directional	1200x1200dpi
Glossy Photo Paper2		High	8pass	Bi-directional	2400x1200dpi
Semi-Glossy Photo Paper		Highest	16pass	Bi-directional	2400x1200dpi
Semi-Glossy Photo Paper2					
Heavyweight Glossy Photo Paper					
Heavyweight SemiGlos Photo Paper					
Glossy Paper					
Photo Paper Pro					
Photo Paper Plus					
Photo Paper Plus					
Semi-Glos					
Synthetic Paper					
Adhesive Synthetic Paper					
Proofing Paper					
CAD Tracing Paper	Line Drawing/ Text	Draft (*2)	1pass	Bi-directional	1200x1200dpi
CAD Tranlucent			1pass	Bi-directional	1200x1200dpi
Matte Film		Standard	2pass	Bi-directional	1200x1200dpi
		High (*2)	4pass	Bi-directional	1200x1200dpi
			4pass	Bi-directional	1200x1200dpi

\*1...Unidirectional printing may be automatically selected by the print engine according to the type of image to be printed (such as a graphic image). Unidirectional printing can also be optionally selected from the printer driver.

\*2...Optionally selectable from the printer driver.

\*3...The driver selects an optimal pass count automatically to suit print data.

## 2.2.4 Print Position Adjustment Function

This printer supports a print position adjustment function to adjust the vertical and horizontal print position and the bidirectional print position of the print head mounted on the carriage and the feed rate.

Print position adjustment work in two modes: automatic adjustment, in which print position adjustment patterns printed are detected by a multisensor attached to the lower left part of the carriage, and manual adjustment, in which print position adjustment patterns that are slightly modified from one another are printed, so that visually verified adjustment values can be set from the operation panel.

To make print position adjustment, A4-or-larger-sized roll media or cut media are needed.

## 2.2.5 Head Management

This printer supports a nozzle check function to spot non-discharging nozzles in the printhead. When the printer detects a non-discharging nozzle, it starts cleaning the printhead automatically to correct its discharge failure. If cleaning does not work, the printer backs up the non-discharging nozzle with an alternative nozzle automatically to ensure unfailing print performance.

Detection timings (automatic): Power-on, open carriage cover detection, print start (check timing variable by selecting Nozzle Check from the system menu)

## 2.2.6 Printhead Overheating Protection Control

When an abnormal temperature rise in the printhead is detected, overtemperature protection control launches. Overtemperatures could occur in the printhead after a spell of print operations without the nozzles being filled with inks.

Overtemperature protection control prevents non-discharge failures and damages that might result from an overheated printhead.

Overtemperature protection control is implemented on the basis of the temperature detected by the head temperature sensor for each nozzle. When an abnormal temperature is detected in any nozzle train, overtemperature protection control is exerted at one of two levels according to that temperature.

### **Protection level 1**

If the head temperature sensor (DI sensor) has detected a temperature higher than the protection temperature, it halts the carriage temporarily at the scan end position in the direction of travel according to the carriage scan status.

Printing resumes when the printhead radiates naturally to cool down to below a predetermined temperature or when 30 seconds or longer have elapsed since the detection of the temperature higher than the protection temperature.

### **Protection level 2**

When the head temperature sensor (DI sensor) has detected an abnormal temperature, the printer shuts down the print operation immediately, moving the carriage to the home position for capping, with an error indication on the display.

## 2.2.7 Pause between Pages

An inter-page function is available to prevent ink rubbing, which keeps paper just printed hanging above the platen and waiting for a predetermined period of time before delivery.

The wait time is user-programmable from the print driver. This feature is particularly useful on paper that takes time to dry after printing.

A 30-second drying time is set automatically for borderless printing.

## 2.2.8 White Raster Skip

This printer supports a white raster skip function to bypass carriage scanning in a consecutive sequence of voids in print data for added throughput.

## 2.2.9 Sleep Mode

The printer has sleep mode to save on its standby power requirement.

The printer transitions to sleep mode automatically when it has been left idle or no print data has been received for a predetermined period of time while the printer is online or offline.

The printer exits sleep mode when any operation panel key is activated or print data is received from the host computer.

The time to transition to sleep mode is variable from the operation panel.

(Default: 5 minutes)

## 2.3 Printer Mechanical System

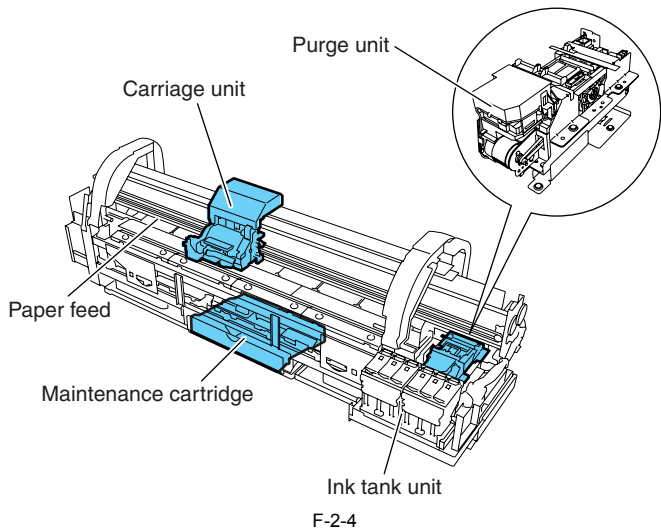
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### 2.3.1 Outline

#### 2.3.1.1 Outline

The printer mechanism is broken down into two broad sections: the passage and paper passage. Consisting mainly of a carriage unit that houses ink tanks and a printhead, and a maintenance cartridge, the ink passage supplies, circulates, sucks and otherwise handles inks. The paper passage consists of such mechanical components as a paper unit and is designed to feed, convey and deliver paper in two ways.

A summary description of each mechanical component is given below.



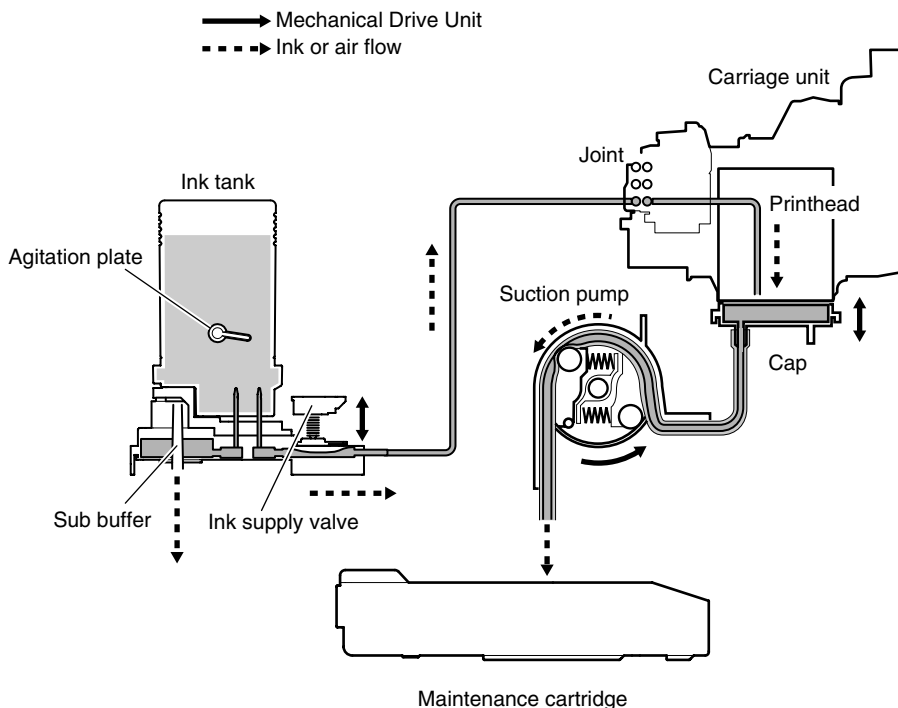
## 2.3.2 Ink Passage

### 2.3.2.1 Ink Passage

#### 2.3.2.1.1 Overview of Ink Passage

The ink passage comprises ink tanks, a printhead, caps, a waste ink collector, ink tubes interconnecting the mechanical components, and a suction pump that is driven to suck inks. It supplies, circulates, sucks and otherwise handles inks.

The ink passage (per color) is schematically shown below, along with the ink flow.



F-2-5

#### a) Supplying inks from the ink tanks to the ink supply valve assembly

The ink tanks each contain an ink to feed the printhead.

Head differences allow the inks to flow from the ink tanks to the ink supply valves.

#### b) Inks flowing from the ink tanks into the subbuffer

As the inks flow from the ink tanks to the subbuffers due to head differences, air infiltrates the ink tanks through air passages in the subbuffers to keep its internal pressure constant.

When the ink stored in a subbuffer exceeds a predetermined level, it flows into the absorber under the ink tank through the air passage.

#### c) Supplying inks from the ink supply valves to the printhead

The ink stored in an ink tank flows to the printhead when the suction pipe is driven with the ink supply valve opened and the head capped.

As an ink is sucked from the caps, it flows into the waste ink absorber under the maintenance cartridge or purge

unit.

#### **d) Ink supply while printing**

The ink supply valves are kept open while printing, so that inks are being constantly fed to the printhead under the negative pressure of the nozzle assembly caused by discharging inks.

Further, waste inks sucked in a cleaning operation and inks from borderless printing flow into the waste ink absorber under the maintenance cartridge or purge unit and into the waste ink box.

---



When an ink tube filled with ink, opening all whole ink passages (by opening both the ink supply valve and the printhead fixer lever with an ink tank yet to be installed) could cause the ink in the ink tube to flow backward due to a head difference, leaking through the hollow needle in the ink tank.

As a precaution, never open all the ink passages at the same time while the ink tubes are filled with inks.

---

#### **e) Agitating the ink in an ink tank**

To prevent the pigment ink stored in a tank from settling, the ink needs to be agitated.

The ink supply valve is continuously opened and closed to cause the ink to flow back into the tank for agitation. Each ink tank contains an agitating plate to aid in agitating of the ink. (An agitating plate is also installed in the dye ink tank.)

-Operation timing: Whenever a new tank is installed or 168 hours have expired since the agitation was last carried out (agitation is carried out regardless of whether printing or cleaning is in progress).

-Ink supply valve open/closed: 30 times (30 seconds)

If 336 hours or more have elapsed, the ink supply valve open/closed count and the time to the next session of agitation are varied according to the elapsed time.

### **2.3.2.2 Ink Tank Unit**

#### **2.3.2.2.1 Structure of Ink Tank Unit**

##### **a) Ink tanks**

Each color-specific ink tank is filled with 130 mL of ink (90 mL for the starter ink tanks bundled with the printer). The ink level in each ink tank is memorized in EEPROM attached to the tank and is detected as a dot count on the basis of the EEPROM information.

When an electrode attached to a hollow needle detects no continuity, it displays a message reporting that the ink tank is nearly empty. If the dot count reaches a predesigned value in this state, an ink out condition is assumed.

##### **b) Ink port**

Depressing the ink tank fixer lever on the printer would cause a hollow needle to pierce the ink port sealed by a rubber plug, linking the ink passage of the ink tank to the printer.

##### **c) Air passage**

Depressing the ink tank fixer lever on the printer would cause an open hollow needle to pierce the air passage sealed by a rubber plug, releasing the internal pressure of the ink tank to keep it constant.

##### **d) Notches for preventing incorrect installation**

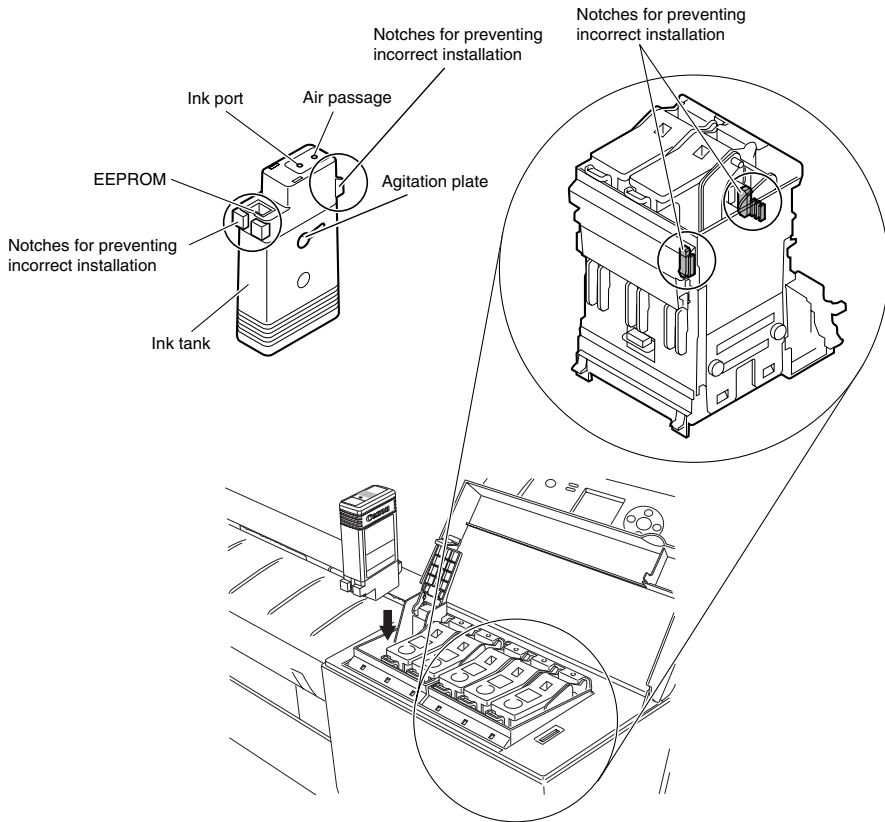
Ink tanks are furnished with a notch for preventing incorrect installation. If the installation of an ink tank in incorrect position is attempted, the notch would interfere with it, preventing its installation.

The ink tank fixer lever won't lower without the ink tank fully inserted to reach the mounting position, so the ink cannot be supplied.



**e) Agitating plate**

Assists in the agitation of pigment inks during ink agitation carried out to prevent their settlement.

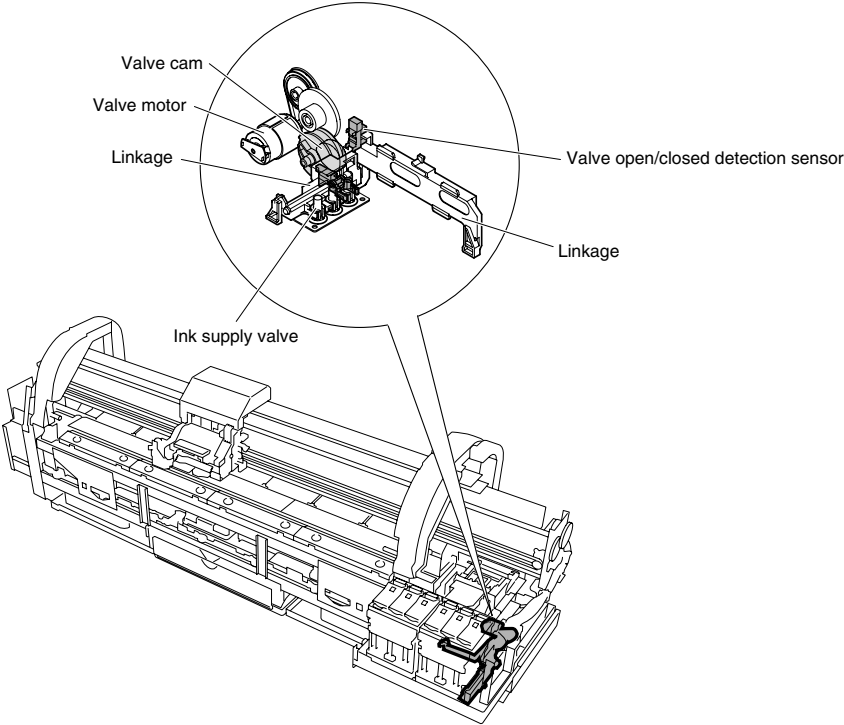


F-2-6

**f) Ink supply valves**

Located halfway between the ink tanks and the ink tubes, the ink supply valves prevent the leakage of inks that might otherwise be caused by the opening of the ink tubes on the side of the ink tanks during their replacement. The ink supply valves are caused to open and close by the valve open/close mechanism that is activated by driving the valve motors.

The ink tank unit comprises two tank bases, each integrated for a set of three colors, and six-color ink tubes. The color-specific ink supply valves are linked with the valve cams so they will open and close at the same time for all colors.



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### 2.3.2.3 Carriage Unit

#### 2.3.2.3.1 Functions of Carriage Unit

##### a) Printhead mounting function

The carriage, which fixes the printhead in position mechanically, is connected to the contact of the head relay PCB.

##### b) Control function

The carriage carries a carriage relay PCB, which relays printhead drive signals, and an encoder, which generates print timing signals. The carriage relay PCB is connected to the main controller by a flexible cable.

##### c) Carriage drive function

The carriage is caused to reciprocate level on the platen by means of the carriage belt that is driven by the power imparted from the carriage motor.

##### d) Printhead maintenance function

This printer performs cleaning operations, such as wiping the printhead and sucking inks, with the carriage halted at its home position.

##### e) Nozzle check function

This printer carries out an ink discharge operation with the carriage halted at the maintenance jet tray, locating the nozzles in the printhead failing to discharge with a head management sensor attached to the head management sensor.

##### f) Carriage height adjustment function

The separation between the face of the printhead and the paper varies with each paper thickness. A narrow gap makes quality better but could smear the print surface as a result of paper rubbing against the face or cause damage to the nozzle assembly.

T-2-2

Head height (mm)	Media type Environmental condition (Temperature:15-25,Humidity:40%-60%)
1.45	Glossy Paper,Plain Paper(Line drawing)
1.75	Plain Paper,Heavyweight Coated Paper(Line drawing)
2.05	Heavyweight Coated Paper
2.35	Premium Matte Paper
2.65	Premium Matte Paper(Temperature:15-30,Humidity:10%-40%)

##### g) Paper width detection function/skew detection function

The multisensor attached to the lower left part of the carriage detects the width of paper fed on the platen and skews in it.

##### h) Automatic printhead position adjustment function

The multisensor attached to the lower left part of the carriage reads the result of an adjustment pattern printed, allowing for automatic adjustment of the printhead position accordingly.

##### i) Remaining roll media detection function

The printer prints a bar code on roll media when they are unloaded. The multisensor attached to the lower left part of the carriage indicates the remaining volume of roll media.

##### j) Internal unit temperature sensor

A thermistor installed on the head relay PCB detects the internal unit temperature near the printhead.

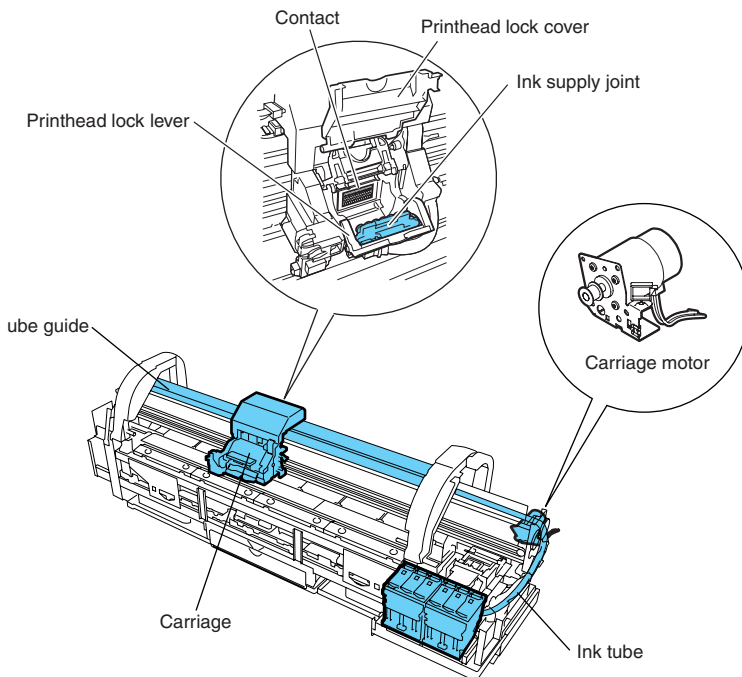
## 2.3.2.3.2 Structure of Carriage Unit

**a) Printhead mount**

The printhead is secured to the carriage by the printhead fixer cover and the printhead fixer lever. When the printhead is secured to the carriage, the signal contact of the head relay PCB is pressed against that of the printhead to convey print signals. Further, the ink passage from the ink tanks is connected to the printhead via the ink tubes.

**b) Ink port**

Ink is supplied to the printhead via an ink tube, which runs between the tube guides via joints to reach the carriage and follows up its motion.



F-2-8

**c) Controller**

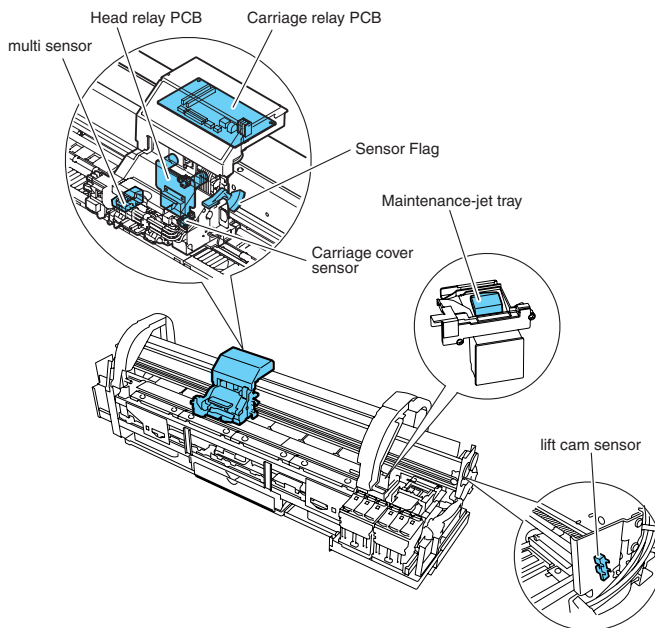
The carriage relay PCB is connected to the head relay PCB by means of a flexible cable. The flexible cable between the main controller and the carriage relay PCB follows up the motion of the carriage together with the tube guide.

A photocoupler encoder mounted in the lower part of the back of the carriage detects a linear scale reading as the carriage moves.

**d) Carriage drive**

Mechanical misregistrations in the vertical/horizontal and bidirectional print positions of the printhead mounted can be corrected by selecting Adjusting Printer from the [MAIN MENU] to [Adjust Printer].

A DC-operated carriage motor drives the carriage in the horizontal direction of paper by way of the carriage. The carriage home position, is where the carriage is slowly brought to the right end at power-on initialization. When the linear scale position is set as a reference home position for use in subsequent position control operations, the driving of the carriage motor is controlled by control signals generated from the main controller.



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### e) Printhead maintenance unit

This printer cleans the printhead with the carriage halted at its home position.

Wiping is executed in sync with the rotation of the motor. Wipers mounted on the carriage wipe the printhead while the carriage is halted at its home position.

A maintenance jet is discharged as the carriage travels to pass the maintenance jet tray to the right of the plant. A suction operation is carried out by a suction cap in the purge unit.

### f) Carriage height adjustment unit

When the lift motor is driven to rotate the lift lever, the carriage shaft height is varied to change the separation between the face of the printhead and the paper.

The printhead height is detected by the multisensor attached to the lower left part of the carriage

### g) Multisensor

The multisensor attached to the lower left part of the carriage consists of four LEDs (red, blue, green, infrared) and two light-receiving sensors to detect the leading edges and width of paper and skews in it, and to adjust its registration and head height.

The multisensor standard has a white plate attached to it, so that a reference value can be calculated during paper gap measurement by measuring the intensity of light reflected upon the white plate.

(Service mode: SERVICE MODE > ADJUST > GAP CALIB)

### h) Rail cleaners

The shaft cleaners located on both sides of the carriage clean the carriage shaft and give a coat of an impregnating oil to the shaft.

### i) Internal unit temperature sensor

One thermistor is installed on the head relay PCB on the back of the head holder to detect the internal unit temperature.

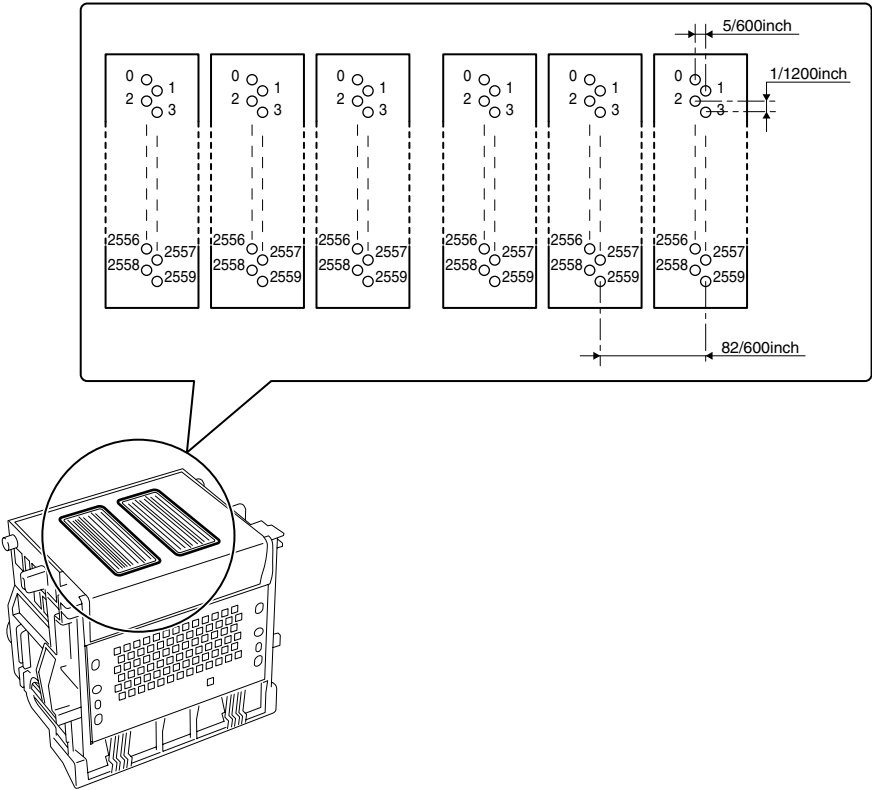
2.3.2.4 Printhead

2.3.2.4.1 Structure of Printhead

The printhead is an integrated assembly of six trains of nozzles. Capable of controlling each nozzle individually, the printhead implements discharge control for six colors by itself.

a) Nozzle arrangement

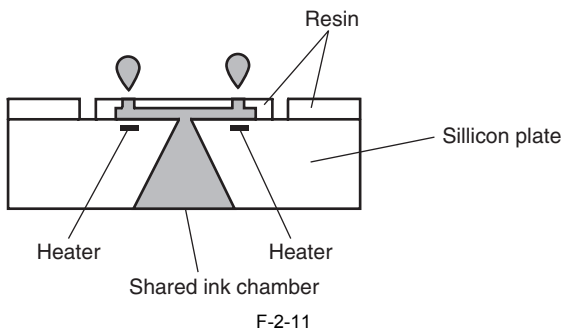
The nozzle assembly is formed of 1,280 nozzles arranged at 600-dpi intervals in a zigzag pattern, offering a total of 2,560 nozzles 1,200-dpi intervals.



F-2-10

### b) Nozzle assembly structure

Inks supplied from the ink tanks are filtered through a mesh ink filter before being sent to the nozzle assembly. Each nozzle train is supplied with an ink from the common nozzle chamber. When a head drive current flows through the nozzle heater, the ink boils, generating bubbles to discharge ink drops from the nozzle from the nozzle assembly.



## 2.3.2.5 Purge Unit

### 2.3.2.5.1 Functions of Purge Unit

The purge unit maintains the nozzle assembly of the printhead to maintain print quality. Functions provided by the purge unit include capping, cleaning and ink supply.

#### a) Capping function

The capping function presses the caps in the purge unit against the face plate of the nozzle assembly to protect against drying and foreign matter adherence.

Capping takes place at the end of printing, during a suction operation and when the printer stands by in the wake of an error occurrence.

The capping function connects the printhead to the ink passage of the purge unit.

#### b) Cleaning function

The cleaning function restores the nozzles to facilitate ink discharges through them. It consists of the following three operations:

-Wiping operation

Wipe off paper fibers or residual inks adhering to the face plate of the printhead.

-Pumping operation

Sucks inks from the nozzle assembly and refreshes the inside of the nozzles with new inks.

-Maintenance jet operation

Discharges inks from the nozzle assembly to the caps or to the borderless printing ink jet tray and paper surface to remove bubbles in the nozzles and dust around the ink discharge ports.

The cleaning function is described below

T-2-3

Cleaning mode	Name	Description of cleaning
Cleaning 1	Normal cleaning	Removes dried ink from nozzles, thick ink accumulated on the face, and paper particles.
Cleaning 2	Ink level adjustment cleaning	Adjust the ink level in the head by suction, and then performs normal cleaning.

Cleaning mode	Name	Description of cleaning
Cleaning 3	Initial filling ink	Fills the empty tube (during initial installation) with ink, and then performs normal cleaning.
Cleaning 4	Ink drainage for head replacement	Drains ink to replace the head (drains only the ink in the head).
Cleaning 5	Ink drainage for secondary transport	Drains ink from the head and tube for secondary transport.
Cleaning 6	Normal (strong) cleaning	Performs suction stronger than when adjusting the ink filling amount in the head or normal cleaning to unclog nozzles.
Cleaning 7	Aging	Performs idle ejection after replacement of the head.
Cleaning 8	Flushing	Performs idle ejection to remove burnt deposits on the surface of the head heater.
Cleaning 10	Ink filling after secondary transport	Fills the empty tube (during installation after secondary transport) with ink, and performs normal cleaning.
Cleaning 15	Dot count suction	Performs suction to remove ink adhered to dried nozzles and thick ink accumulated on the face when the dot count reaches the prescribed value.
Cleaning 16	Precipitated ink agitation	Performs the agitation (ink supply valve open/close) operation to prevent the ink ingredient from precipitating.
Cleaning 17	Cleaning (weak)	Performs cleaning weaker than normal cleaning to unclog nozzles.



The cleaning operation is executed at the following timing:

T-2-4

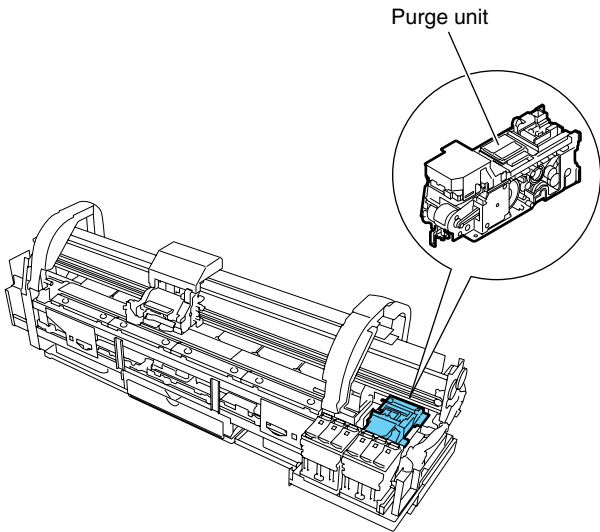
Printer status		Description of cleaning
During standby	Each time 120 minutes have elapsed with the nozzles capped	Cleaning 1 (normal cleaning)
	When 168 hours have elapsed since capping	Idle ejection
	When 360 hours have elapsed since capping	Cleaning 2 (ink level adjusting cleaning)
	When 720 hours have elapsed since capping	Cleaning (normal cleaning)
	When 2160 hours have elapsed since capping	Cleaning 6 (normal (strong) cleaning)
	When 168 hours have elapsed since initial installation or previous agitation of precipitated ink (cleaning 16)	Cleaning (precipitated ink agitation)
At power-on	During initial installation	Cleaning 3 (initial filling cleaning)
	When the power is turned on after less than 72 hours have elapsed since abnormal end of print operation (uncapped status)	Cleaning 1 (normal cleaning)
	When the power is turned on after at least 72 hours have elapsed since abnormal end of print operation (uncapped status)	Cleaning 6 (normal (strong) cleaning)
	When the power is turned on after the initial installation or previous precipitated ink agitation (cleaning 16)	Cleaning (precipitated ink agitation)
	When the power is turned on after at least 360 hours have elapsed since normal end of print operation (capped status)	Cleaning 2 (fluid level adjusting)
	When the power is turned on after at least 360 hours have elapsed since normal end of print operation (capped status)	Cleaning 6 (normal (strong) cleaning)
At power-off	When the power is turned off in the uncapped status	Wiping + Idle ejection + Idle suction + Capping
Before starting printing	Before printing after 168 hours have elapsed since capping	Idle ejection
	Before printing after 168 hours have elapsed since capping	Cleaning 1 (normal cleaning)
	Before cleaning after occurrence of an error	Cleaning 1 (normal cleaning)
During printing	Between scan operations during scanning	Idle ejection + Wiping (idle suction)
After printing	After printing exceeding the prescribed dot count	Cleaning 16 (dot count suction) based on the count or cleaning 6 (normal (strong) cleaning)
	Each time 120 minutes have elapsed in the cap open status	Cleaning 1 (normal cleaning)

Printer status		Description of cleaning
When "Head Cleaning" menu is selected	Manual cleaning (head cleaning A)	Cleaning 1 (normal cleaning)
	Manual cleaning (head cleaning B)	Cleaning 6 (normal (strong) cleaning)
When "Replace Head" menu is selected	After replacement of head	Cleaning 2 (fluid level cleaning) + Cleaning 4 (ink drainage after head replacement)
When "Move Printer" is selected	When "Move Printer" is selected	Cleaning 5 (ink drainage for secondary transport)
	After the power is turned on during secondary installation	Cleaning 10 (ink filling after secondary transport)

c) Ink supply function

The suction pumps in the purge unit are activated, together with ink supply valves, during initial filling and ink level adjustment to supply inks from the ink tanks to the printhead.

2.3.2.5.2 Structure of Purge Unit



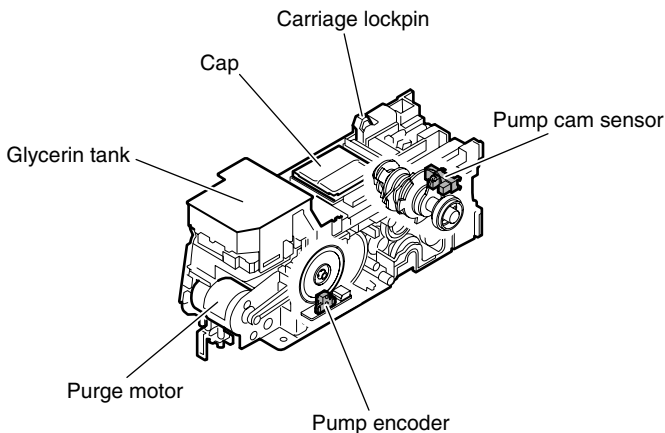
F-2-12

**a) Caps**

The caps cap the nozzle assembly in the printhead during cleaning. The part of the caps that comes into contact with the face plate of the nozzle assembly is made of rubber. Two caps are in position to meet the printhead mounted on the printhead (six trains of nozzles).

These caps cap the nozzle assembly to suck inks from the printhead by means of the suction pump.

The caps are elevated by the cap cam that is driven by the purge motor when the carriage moves to the home position, capping the nozzle assembly to protect it.



F-2-13

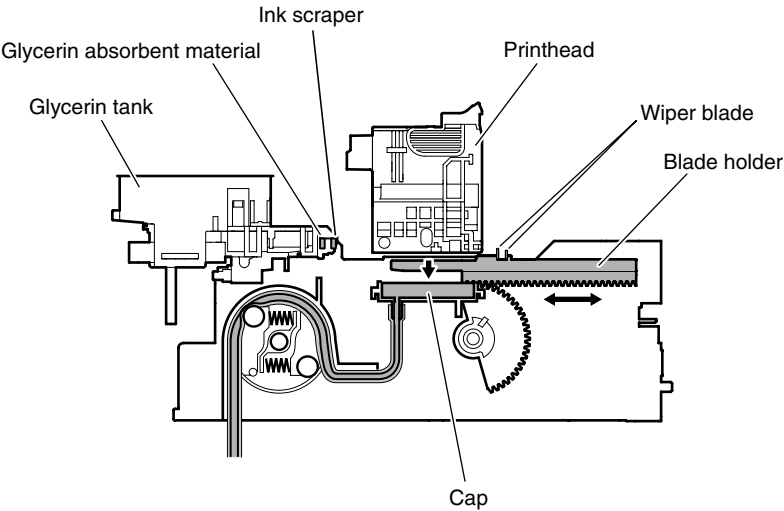
**b) Wipers**

The wipers are driven by the purge motor to wipe the face of the printhead. A pair of two wiper blades are installed to ensure wiping performance. The wiping operation operates on a slide wiping basis, sliding the wiper blades via wiper cams through the rotation (normal) of the purge motor. Wiping is executed by the wiper blades moving at a constant speed to the front of the printer after the end of a print or suction operation.

A wiper blade set perpendicularly to the head wipes the entire face of the printhead, followed by a narrower blade wiping the nozzle assembly. The wiper blades are cleaned after wiping before they are replaced at the wiping position to maintain wiping performance. Wiper blade cleaning is carried out by scraping off the inks that have been wipe off from the head with the ink scraper. The wiper blade is subjected to wet wiping, whereby it is pressed against an absorber impregnated with glycerin for added wiping removal performance. The quantity of glycerin used (tank capacity: 50 mL) is managed by counting the number of times the wiper blade has been pressed against the absorber. When this count falls to equal any of the following values, either a replacement warning (continued print available) or replacement required indication (service call error) is issued:

T-2-5

Advance notice of replacement	47,500times
Service call	50,000times

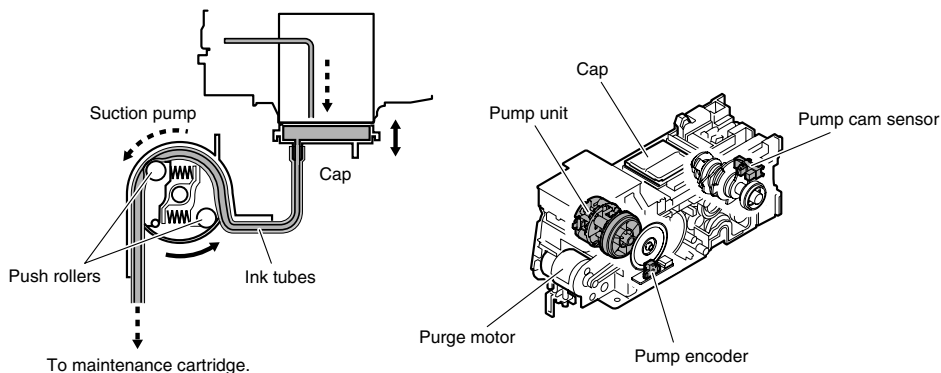


F-2-14

### c) Pump

The pump (suction pump) is a tube pump that pressurizes the ink tubes with rotating rollers to generate a negative pressure for sucking inks.

A single tube is sequentially pressurized by a pair of rotating rollers to control the level of ink suction. The timing at which the rotating rollers rotate is detected by the pump cam sensor, with the distance of rotation being controlled by the driving of the purge motor.



F-2-15

## 2.3.2.6 Maintenance Cartridge

### 2.3.2.6.1 Maintenance cartridge

#### a) Maintenance cartridge

The maintenance cartridge holds about 1000 mL of used inks (about 867 g: including the evaporation of moisture from the used inks).

#### b) Used maintenance cartridge ink detection

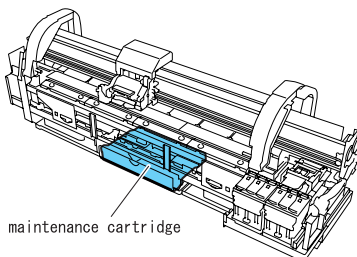
Used maintenance cartridge ink detection is monitored with regard to a dot count.

When the used ink reaches 80% of the cartridge capacity, the warning message "Maintenance C Space Check" is displayed to tell that the maintenance cartridge is nearly full.

Further use of the maintenance cartridge will cause the appearance of the message "Replace Maintenance Cartridge" to report that the maintenance cartridge is full.

When this error is displayed, the printer assumes that the used ink tank is full, shutting down its operation even while it is printing until the maintenance cartridge is replaced.

The maintenance cartridge houses EEPROM, so that engine firmware can control the status of the maintenance cartridge by writing to and reading from the EEPROM content.

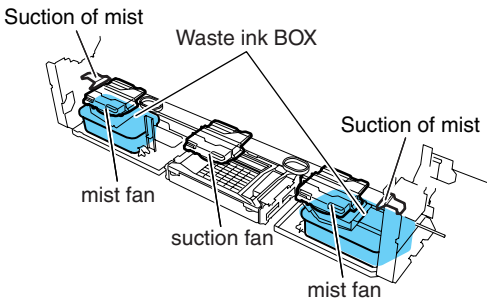


F-2-16

2.3.2.7 Air Flow

2.3.2.7.1 Air flow

This printer is furnished with two fans: a mist fan, which collects ink mist, and a platen fan, which allows paper to be adsorbed on the plate, and a platen fan.  
Ink mist floating during printing or bouncing back from the paper is collected in the maintenance cartridge by airflow in the printer.  
Airflow fans located on both sides of the printer, coupled with the suction fan in the middle of the printer, create airflow to carry the ink mist to the mist suction port.



F-2-17

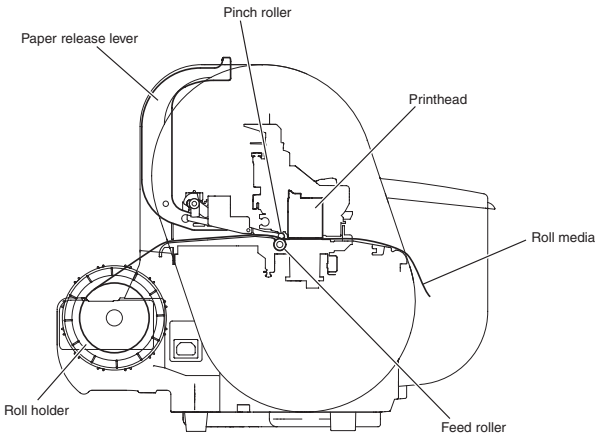
2.3.3 Paper Path

2.3.3.1 Outline

2.3.3.1.1 Overview of Paper Path

The key components of the paper passage consist of a feed roller assembly, a pinch roller drive that locks and releases the pinch roller and sensors that detect the feed status of paper. It feeds paper in trays, conveys and delivers paper.

Paper passage schematic diagram



F-2-18

**Basic operation of the paper loading sequence**

- 1) Light intensity
- 2) Detection of leading edge of media
- 3) Paper width detection sensor  
Detects the left and right edges of paper.
- 4) Barcode read  
\*This function is operable only if the remaining roll media detection sensor is turned on.
- 5) Detection of leading skew of media.
- 6) Detection of leading right edge of media.
- 7) Detection of precut  
\*When "precut" is only an automatic cutting, it does.
- 8) Precut of media  
\*In the following cases, the form point is cut.
  - a. When "Up-to-date precut" is a compulsion cutting.
  - b. When necessary having of cutting is judged from an automatic cutting, "Up-to-date precut" :.
  - c. When "Roll paper remainder amount detection" is on, and the bar code is detected (Compulsorily cut it regardless of the setting of "Up-to-date precut").
- 9) Detection of leading edge of media.

**Basic operations of the cut media loading sequence**

- 1) Paper trailing edge detection sensor
  - 2) Light intensity
  - 3) Detection of paper width
  - 4) Detection of skewed movement of paper
- 

**MEMO:**

When offline, press the [ ▼ ] key to discharge the media and the [ ▲ ] key to rewind the media.

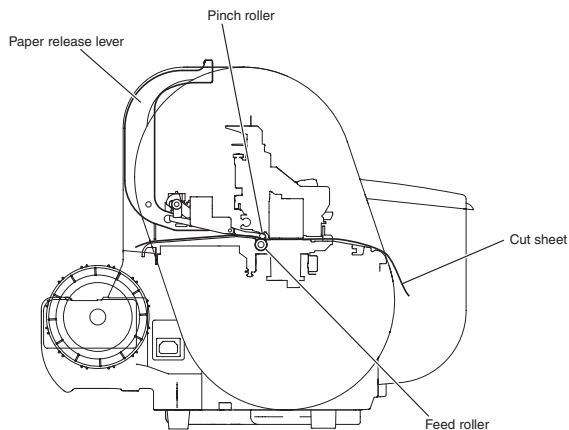
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**2.3.3.2 Paper Path****2.3.3.2.1 Feed Roller Eccentricity Detection Function****a) Feed roller assembly**

The feed roller assembly consists mainly of a feed roller that is driven by the feed motor, a pinch roller unit that follows up the motion of the feed roller and so on.  
Paper is fed horizontally under the printhead on the carriage as it is kept level on the platen to prevent heaving.

**b) Sensors**

The feed roller assembly includes a feed status detection sensor and paper passage mechanical component status detection sensors.  
For more details, see Technical Explanation > Detection Functions.



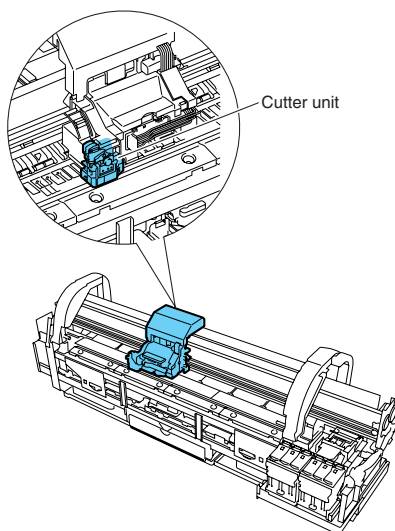
F-2-19

### 2.3.3.3 Cutter Unit

#### 2.3.3.3.1 Structure of the cutter unit

##### a) Sheet cutter

When "Autocut: Yes" is selected in the Printer Driver, the cutter unit mounted on the left side of the carriage automatically cuts the roll media. However, the roll media is not cut if it is suppressed by the Printer driver.



F-2-20



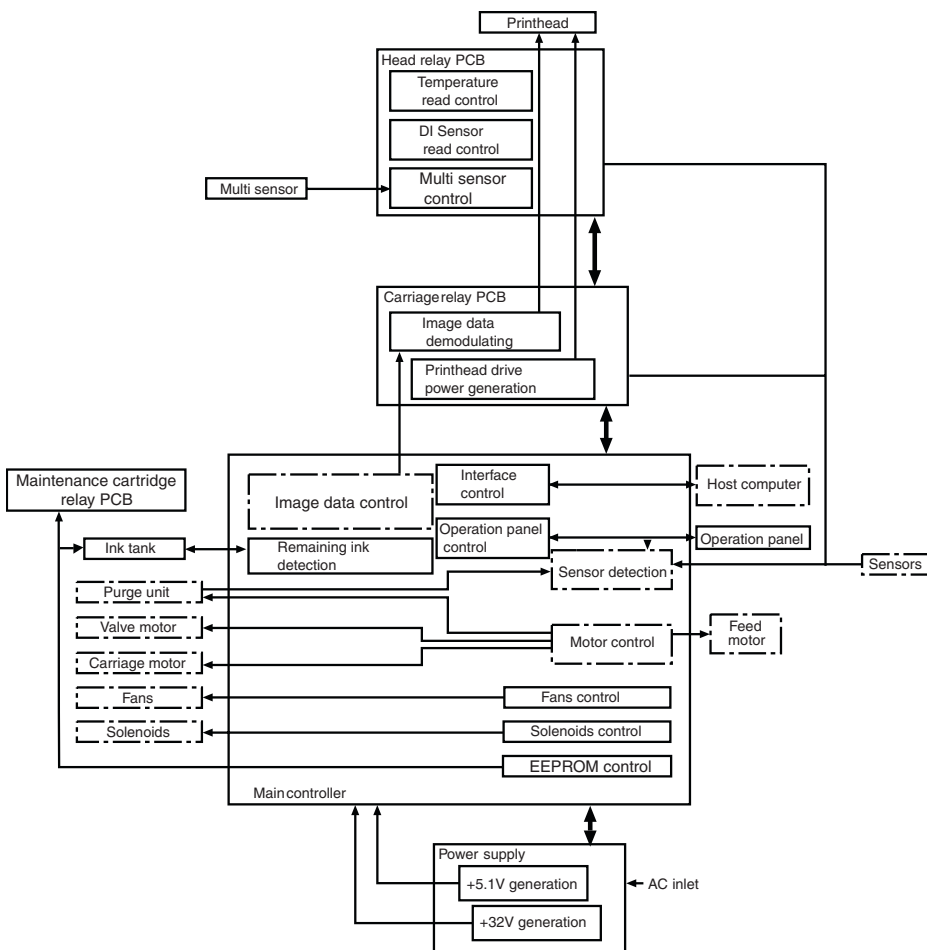
## 2.4 Printer Electrical System

### 2.4.1 Outline

#### 2.4.1.1 Overview

The printer electrical system consists of the main controller PCB and power supply PCB which are mounted on the back side of the printer, the carriage relay PCB, the head relay PCB, and printhead which are mounted in the carriage, the operation panel on the right upper cover and other electrical components such as sensors, and motors.

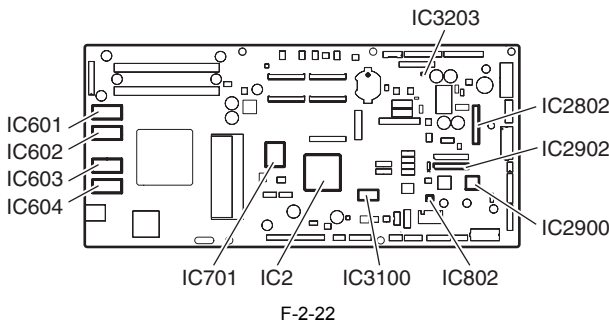
The main controller PCB manages the image data processing and the entire electrical system, and controls relay PCBs and driver functions.



F-2-21

## 2.4.2 Main Controller

### 2.4.2.1 Main controller components



#### a) ASIC (IC2)

The ASIC with a 16-bit internal bus is driven in sync with the 66 MHz external clock. It supports the following functions:

##### **Image processing unit**

This unit converts the RGB multi-bit image data or CMYK multi-bit data received from the host computer through the interface connector to the binary image data for the ink colors used.

##### **DMA controller**

This controller controls the input interfaces such as the USB and expansion card slot as well as DMA transfer of the data to be stored in the DIMM.

##### **Image data generation/output function**

This function generates image data for color printing from the received image data and the mask pattern (corresponding to print mode) stored in the DIMM, and store the generated image data in another DIMM. It also outputs the generated image data to the carriage relay PCB.

##### **Interrupt controller**

This controller receives and processes internal interrupts and external interrupts from the USB, image processing unit, and expansion card slot.

##### **Timer function**

Even when the printer is turned off, the timer function is held on using the RTC and secondary lithium battery to assist the cleaning function.

When the power cord is plugged to the outlet, power is supplied to the RTC and therefore the secondary lithium battery power is not consumed.

##### **Heat Enable signal control function**

This function uses the pulse width to perform variable control of the time of application of the Heat Enable signal to the nozzle heater for each nozzle array (PWM control).

##### **Linear scale count function**

This function reads the linear scale when the carriage moves, thus generating the ink jet timing. It also counts the linear scale timing cycle using the reference clock to measure the carriage moving speed.

##### **Dot count function**

This function counts the fired dots used as the information for Heat Enable signal control, maintenance jet control, cleaning control, and remaining ink level for each nozzle array.

##### **Operation panel control function**

This function controls serial communication with the operation panel.

**PWM control function**

This function controls driving of the suction fan and mist fan as well as the temperature of the printhead.

**Remaining ink level detection function**

This function detects the remaining level of each color of ink based on the signal received from the hollow needle mounted in the ink tank unit.

**LED control function**

This function controls the LEDs on the ink tank unit.

**I/O port function**

This function controls input signals from sensors.

**Power ON/OFF control function**

This function controls turning on/off of the drive power (32V and 5.1V) supplied from the power supply PCB.

**Head DI sensor read control function**

This function controls read operation by the head DI sensor.

**Multi sensor control function**

This function controls the LED, gain adjustment, and controls obtainment of the reading of the multi sensor.

**EEPROM control function**

This function controls the EEPROMs of individual ink tanks, the maintenance cartridge EEPROM, the EEPROM on the maintenance cartridge relay PCB, and the head EEPROM in addition to the on-board EEPROM.

**Motor control function**

This function controls the carriage motor, feed motor, valve motor, purge motor, lift motor based on the input signals from sensors.

**b) Driver IC (IC3100)**

This IC generates a carriage motor control signal based on the control signal from the ASIC.

**c) Driver IC (IC2802)**

This IC generates feed motor control signal based on the control signal from the ASIC.

**d) Driver IC (IC2900)**

This IC generates purge motor and valve motor control signals based on the control signal from the ASIC.

**e) Driver IC (IC2902)**

This IC generates a lift motor control signal based on the control signal from the ASIC.

**f) Regulator IC (IC3203)**

This IC generates the 3.3 V to be supplied to the tank ROM board.

**g) DIMMs (IC601, IC602, IC603, IC604)**

The DIMM comprising a 128-MB DDR-SDRAM and a 64-MB SDR-SDRAM is connected to the 32-bit data bus to be used as a work area.

During print data reception, it is also used as an image buffer. It cannot be expanded.

**h) FLASH ROM (IC701)**

A 128-MB flash ROM is connected to the 8-bit data bus to store the printer control program.

**i) EEPROM (IC802)**

The 128-KB EEPROM stores various setting values, adjustment values, log data, counter values related to the user/servicing.

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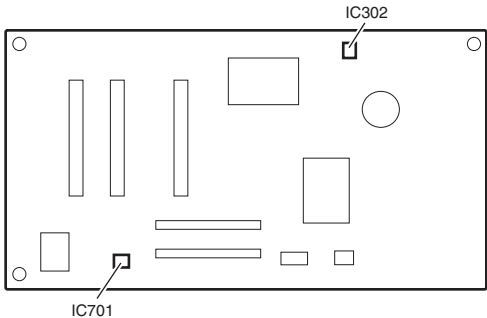
**MEMO:**

After replacement of the main controller PCB, the printer must be started up in the service mode to take over the setting and adjustment values to the new PCB properly (the service mode will be switched to the PCB replacement mode automatically).

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2.4.3 Carriage Relay PCB

2.4.3.1 Carriage relay PCB components



F-2-23

a) Receiver ASIC (IC701)

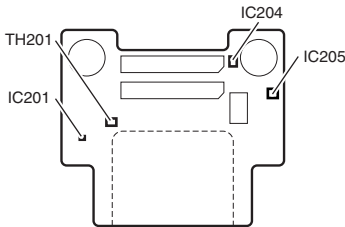
This ASIC relays the image data which are output from the main controller. This ASIC does not process the image data.

b) Regulator IC (IC302)

This IC generates power for the printhead heater.

2.4.4 Head Relay PCB

2.4.4.1 Head relay PCB components



F-2-24

a) Latch IC (IC201)

DI sensor read control function

Obtains reading value of the DI sensor in the printhead and the head rank value for each color and outputs them to the main controller based on the control commands from the main controller.

Environment temperature read control function

Outputs the environment temperature detected by the thermistor on the head relay PCB to the main controller based on the control commands from the main controller.

Relay function of the power to the logic components in the printhead

Supplies the power to the logic components in the printhead based on the control commands from the main controller.

b) Thermistor (TH201)

The environment temperature surrounding the head relay PCB detected by this thermistor is output to the main

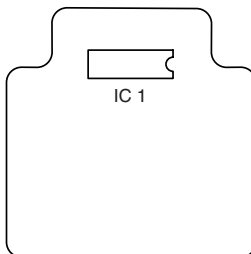
controller through the carriage relay PCB.

### c) Multi sensor control IC (IC204, IC205)

These IC's generates the LED control signals and makes gain adjustment for the multi sensor.

## 2.4.5 Maintenance Cartridge Relay PCB

### 2.4.5.1 Maintenance cartridge relay PCB components



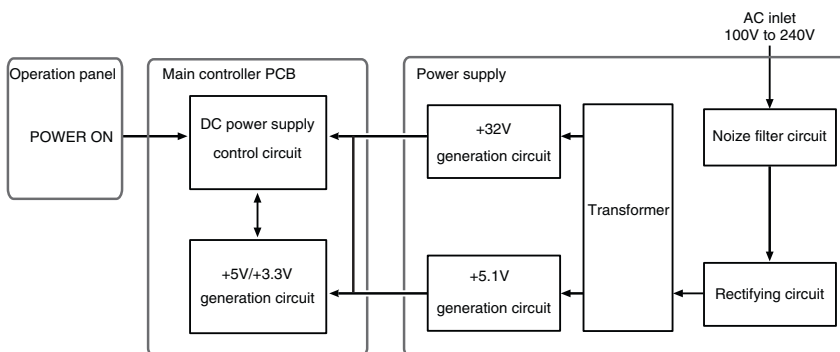
F-2-25

### a) EEPROM (IC1)

The 128-KB EEPROM stores all information written in the EEPROM on the main controller PCB.

## 2.4.6 Power Supply

### 2.4.6.1 Power supply block diagram



F-2-26

The power supply converts AC voltages ranging from 100 V to 240 V from the AC inlet to DC voltages for driving the ICs, motor, and others.

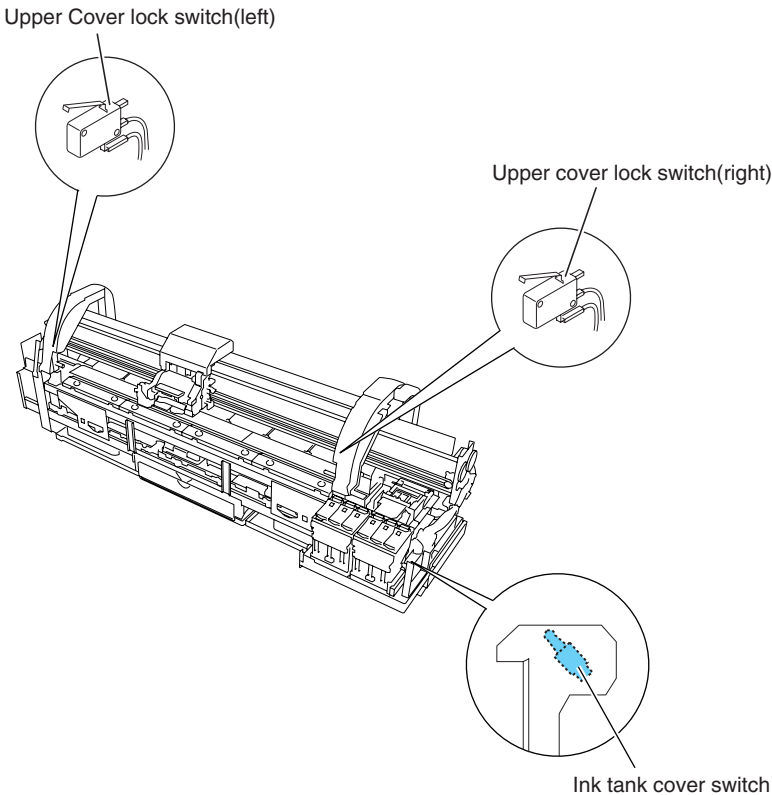
The voltage generator circuits include the +32 V generation circuit for driving motors, fans, and the +5.1V generator circuit for driving sensors, logic circuits.

When in the power saving mode, the power supply cut outs the +32 V and the +5.1 V.

Power ON/OFF operation is controlled by the main controller PCB. When the upper cover is open, the power supply cut outs only the +32V power to the carriage.

## 2.5 Detection Functions with Sensors

### 2.5.1 Sensors for covers



F-2-27

#### Upper cover lock switch

The micro switch-based Upper cover lock switch detects the open/closed states of the upper cover. When the upper cover closes, the switch is pressed to detect the closed state of the cover.

The printer has one sensor installed on the left and right sides each to prevent one-sided tightening of the upper cover.

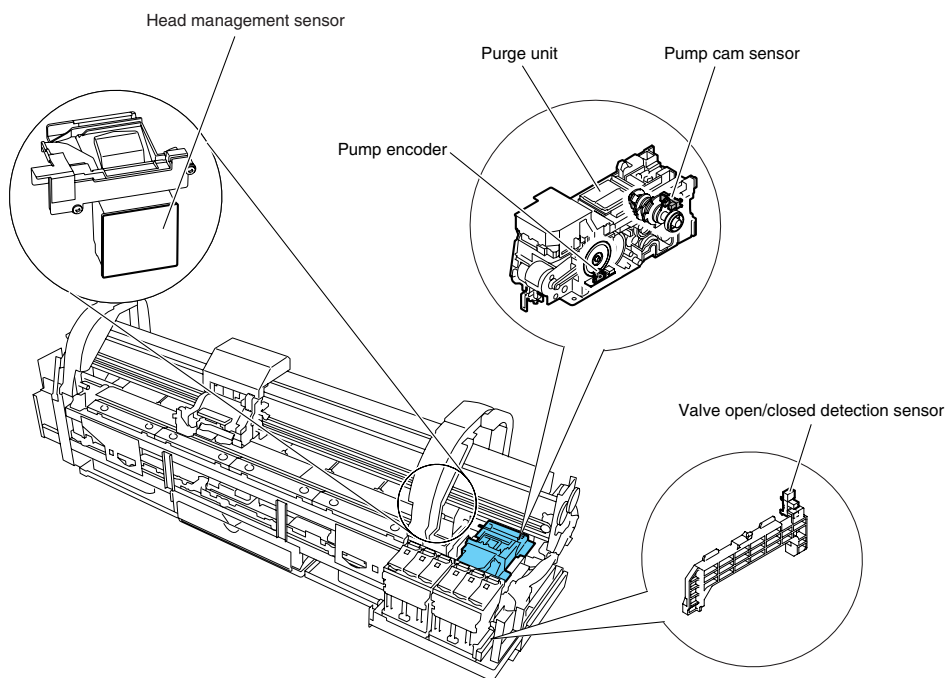
#### Ink tank cover switch

The micro switch-based Ink tank cover switch detects the open/closed states of the ink tank cover. When the ink tank cover closes, the switch is pressed to detect the closed state of the cover.

#### Memo:

+26.5V is supplied from the power supply unit to drive the carriage motor and the feed motor while the top cover is closed.

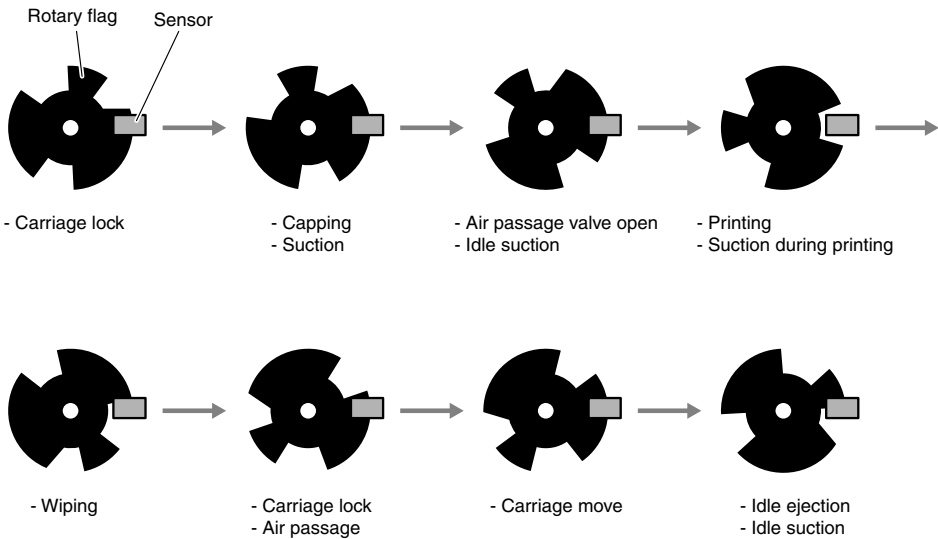
## 2.5.2 Ink passage system



F-2-28

**Pump cam sensor**

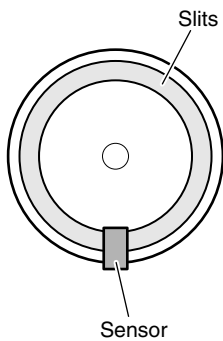
As the cam rotates, it shields the sensor light of the photointerrupter-based pump cam sensor or allows it to be transmitted. The status of the purge unit, such as capped, suction, and wiping, is detected in a combination of the status of detection by the pump cam sensor and the control of purge motor rotation by the pump encoder sensor.



F-2-29

**Pump encoder**

The photointerrupter-based sensor reads slits in the encoder film of the purge motor and controls the amount of its rotation accordingly.



F-2-30

**Valve open/closed detection sensor**

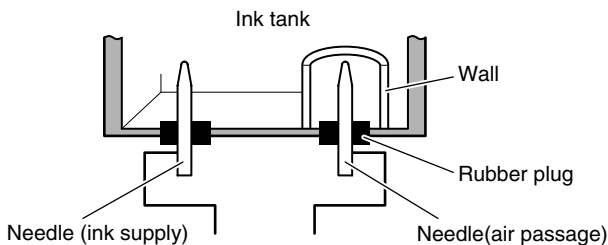
The photointerrupter-based valve open/closed detection sensor detects the status of the valve cam. The sensor detects that the ink supply valve is open when the sensor light is shielded by a link interlocked with the valve cam.



### Ink detection sensor

The ink detection sensor detects the presence or absence of the ink in an ink tank with respect to the status of continuity between two hollow needles.

When the ink level in the tank falls to a point below the wall surrounding the hollow needles in the air passage, continuity with the hollow needle on the ink supply side is disrupted, causing the sensor to detect that ink is out.



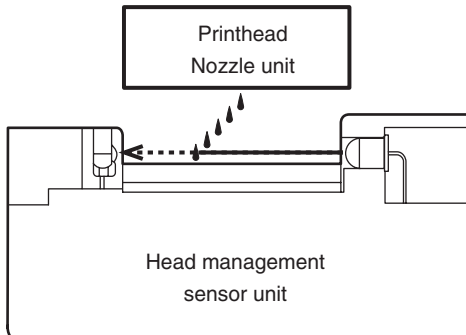
F-2-31

### Head management sensor

The phototransmitter-based head management sensor detects the status of ink discharge from the printhead.

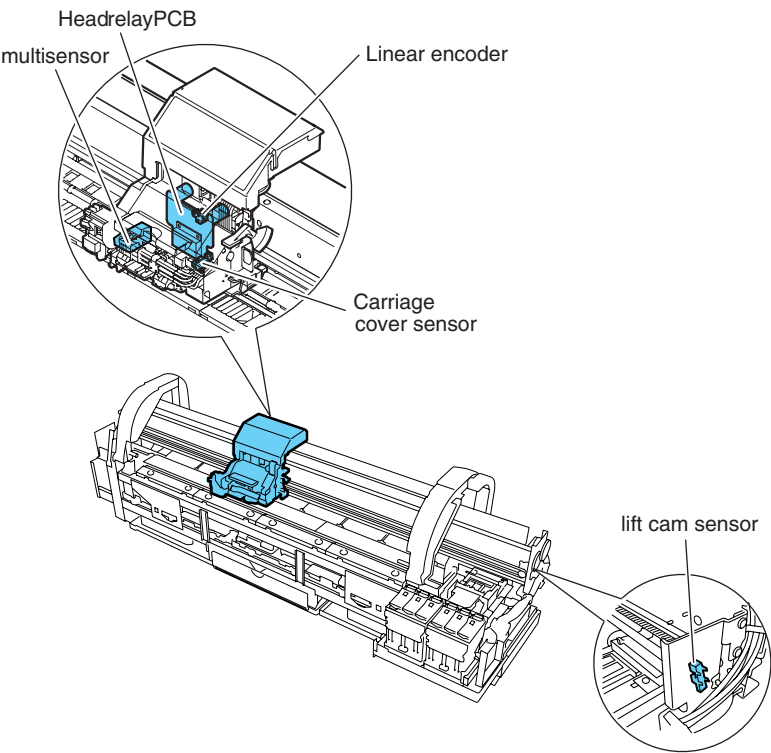
The carriage iteratively moves and stops at the detection position for each nozzle train, discharging inks nozzle by nozzle while it is halted.

The sensor detects discharge nozzles from the voltage changes produced by the drops of an ink discharged from one nozzle at a time shielding the sensor light.



F-2-32

2.5.3 Carriage system

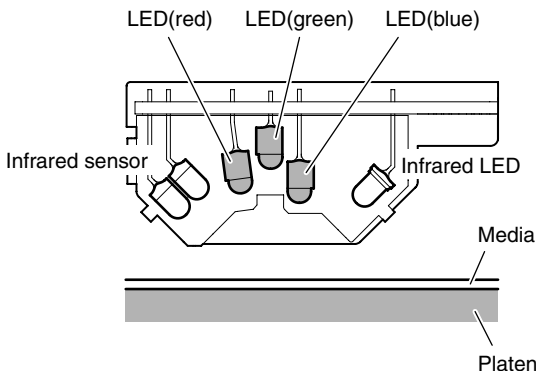


F-2-33

### Multisensor

The photoreflector-based multisensor consists of four LEDs (red, blue, green, infrared) and two light-receiving sensors to detect the leading edges and width of paper and skews in it, and to adjust its registration, head height and calibration.

At head height adjustment, the two light-receiving sensors detect infrared light reflected upon the paper to work out the head height from differences in its measurement.



F-2-34

### Carriage cover sensor

The photointerrupter-based carriage cover sensor detects the opening and closing of the carriage sensor.

When the carriage cover is closed, the sensor light is shielded by the sensor arm, enabling the sensor to detect that the carriage cover is closed.

### Lift cam sensor

A photointerrupter-based sensor. After the sensor light is shielded by the flag, the lift motor is driven by a predetermined number of pulses to regulate the separation between the printhead and platen automatically.

### Linear encoder

Mounted on the back of the carriage, the linear encoder detects the position of the carriage from a slit in the linear scale during its movement.

### Ambient temperature sensor

The thermostat-based ambient temperature sensor mounted on the head relay PCB detects the ambient temperature to which the carriage is exposed.

The resistance of the thermistor that varies as a function of temperature changes in the printer is transmitted to the main controller via the carriage relay PCB.

The ambient temperature is used to help calibrate the head temperature sensor and detect abnormal ambient temperatures.

### Head temperature sensor

The head temperature sensor detects the temperature of the printhead.

The printhead temperature is transmitted to the main controller via the carriage relay PCB.

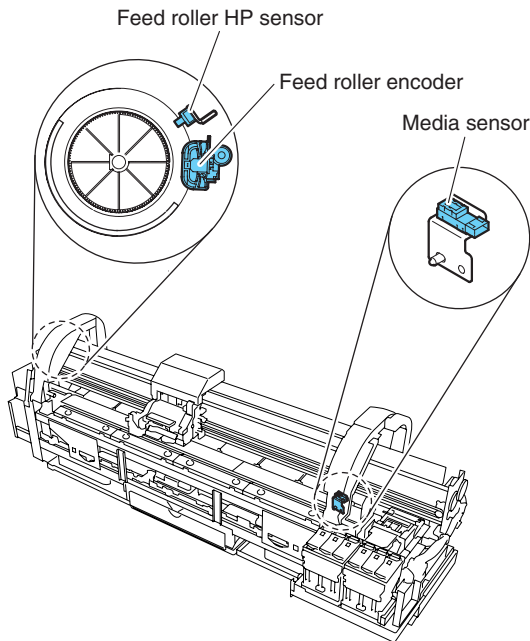
The printhead temperature is used to help control the head drive and detect abnormal printhead temperatures.

### Printhead contact sensor

The printhead contact sensor detects the status of printhead installation by electrical means.

The sensor detects the status of contact from voltage changes in the flexible cables on the carriage side that come into contact with two terminals of the printhead with remote contact surfaces, the power terminals and GND terminal.

## 2.5.4 Paper path system



F-2-35

**Media sensor**

The photoreflector-based media sensor detects the presence or absence of paper on the platen. The sensor detects the presence of paper when it receives sensor light reflected upon the paper.

**Feed roller HP sensor**

The feed roller HP sensor sets an LF eccentricity correction home position by detecting transitions from black (shielded) to white (transmitted), or a reference, in the scale in the code wheel.

**Feed roller encoder**

The feed roller encoder detects the carriage position from slits in the feed roller pulley as it is driven.

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## Chapter 3

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# INSTALLATION

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- 3.1 Transporting the Printer ..... 3-1
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  - 3.1.2 Reinstalling the Printer .....3-2
    - 3.1.2.1 Reinstalling the Printer .....3-2

## 3.1 Transporting the Printer

### 3.1.1 Transporting the Printer

#### 3.1.1.1 Transporting the Printer



When transporting the printer, the printhead must be capped and stay in the carriage.

In spite of this precaution, shocks incurred during transportation can damage the printhead.

Print the nozzle check pattern before making preparations for transporting the printer, print the nozzle check pattern again after installing the printer at the new location, and then compare the two printouts.

If any problem such as nozzle clogging cannot be resolved by printhead cleaning, replace the printhead with a new one.

#### **a.Moving the printer on the same floor having no step**

(1) Turn off the Power button on the printer and check that the head is capped.

(2) Open the top cover and mount the belt stopper.

When mounting the belt stopper, be careful not to move the carriage by applying too much pressure to the carriage. If the carriage moves with the head capped, the rubber part of the cap may touch the nozzles on the head and damage the printhead.

(3) Close the upper cover.

(4) Remove the roll holder from the roll holder slot.

(5) Remove the interface cable, power cord from the printer.

(6) If the printer is installed on a stand, unlock the casters of the stand.

(7) Hold the carrying handles at the bottom, and then slowly move the printer.

If the printer is subjected to strong vibrations when it is moved, it can cause ink leakage and damage to the printhead. Be sure to move the printer slowly and carefully.

#### **b.Moving the printer on the same floor having a step(s)**

When the printer is operating properly, follow the instructions described in "When the printer is not operating".

#### When the printer is operating properly

To prevent the waste ink from leaking, drain the ink, wait about 15 minute, and then remove the maintenance cartridge. Package the removed maintenance cartridge so that the waste ink does not leak.

(1) Turn on the Power button on the printer.

(2) Remove the roll holder from the roll holder slot

(3) Enter the Main menu, and then select "Maintenance" > "Move Printer". Remove all ink tanks following the displayed messages.

Put the removed ink tanks in the plastic bag with the ink port up and close the opening. It takes about 4 minutes to complete the "Move Printer" operation.

\* "Move Printer" cannot be selected when "MT Cartridge Full Soon" is displayed.

In this case, replace the maintenance cartridge first.

\* Never disconnect the power cord or open any cover while the "Move Printer" operation is in progress since this can cancel the operation.

If the "Move Printer" operation is canceled while in progress, the printer will remain in the offline mode and will not return to the online mode.

The "Ink Filling" operation is performed when the power is turned back on after canceling, so repeat the "Move Printer" operation from the beginning.

\* The "Move Printer" operation will drain about 38 g of ink per color from the printer to the maintenance cartridge.

(4) When the "Move Printer" operation is completed, turn off the Power button.

(5) Open the top cover to check that the head is capped, and then secure the carriage with the belt stopper.

(6) Close the top cover.

(7) Disconnect the interface cable, power cord, and ground cable from the printer.

(8) Wait about 15 minutes after completion of the "Move Printer" operation, remove the maintenance cartridge, and then package it so that waste ink does not leak.

Check that waste ink is no longer leaking after removing the maintenance cartridge. If it is leaking, install the maintenance cartridge and wait until waste ink no longer leaks.

(9) Attach the cushioning materials and tape.

(10) If the printer is installed on a stand, remove it from the stand.

(11) Pack the printer in the packing box, and then put the roll media, ink tank, and optional devices in another packing box for moving.

Use the original packing materials for the printer and other optional devices. If they are not available, pack them with a sufficient amount of cushioning materials.

### When the printer is not operating properly

(1) Make sure that the printer is turned off.

(2) Disconnect the interface cable, power cord, and ground cable from the printer.

(3) Remove the roll holder from the roll holder slot.

(4) Drain ink from the printer.

(5) Manually cap the printhead.

\* Manual capping is an emergency measure used when the printer does not operate properly, so it can damage the printhead.

(6) Remove the maintenance cartridge, and then package it so that waste ink does not leak.

(7) Attach all external covers.

(8) Open the top cover, and then secure the carriage with the belt stopper.

(9) Close the top cover.

(10) Attach the cushioning materials and tape.

(11) If the printer is installed on a stand, remove it from the stand.

(12) Pack the printer in the packing box, and then put the roll media, ink tank, and optional devices in another packing box for moving.

Use the original packing materials for the printer and other optional devices. If they are not available, pack them with a sufficient amount of cushioning materials.

Before transporting the printer, be sure to go through the following steps to protect the internal mechanism. For the printer packaging work and the installation work after transportation, refer to the "Quick Start Guide".

\* When "Check Free Space in Maintenance C" or "Replace Maintenance Cartridge" is shown on the display, you cannot make preparations for transportation. First replace the maintenance cartridge, and then make preparations for transportation.

\* Do not incline the printer during transportation. The internal ink may leak and the surrounding area may be stained. If it is necessary to place the printer with either side up or down or to incline the printer, contact your sales agent.

## 3.1.2 Reinstalling the Printer

### 3.1.2.1 Reinstalling the Printer

#### When installing the printer after moving it on the same floor having no step

If you have moved the printer to the installation site on the same floor having no step without draining ink, check the operation test pattern.

#### When installing the printer after moving it on the same floor having a step(s)

If you have moved the printer to the installation site on the same floor having a step(s) with ink drained, install it again in the same manner as that for initial installation after reception of the delivered printer.

1) Unpack the printer.

2) Remove the cushioning materials and tape from the printer.

3) Install the maintenance cartridge.

4) Remove the belt stopper.

5) Connect the power cord.

6) Turn on the Power button and install ink tanks according to the displayed messages. Ink filling will start.

Load paper and check for normal operation.



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## Chapter 4

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# **DISASSEMBLY/REASSEMBLY**

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## 4.1 Service Parts

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### 4.1.1 Service Parts

The service parts indicated below require careful handling.

**1. Keep all packages with the warning not to turn over.**

Pay careful attention to all individually packaged service part (carriage unit, purge unit, ink tank unit, and other parts) boxes marked "This side up" and handle appropriately.



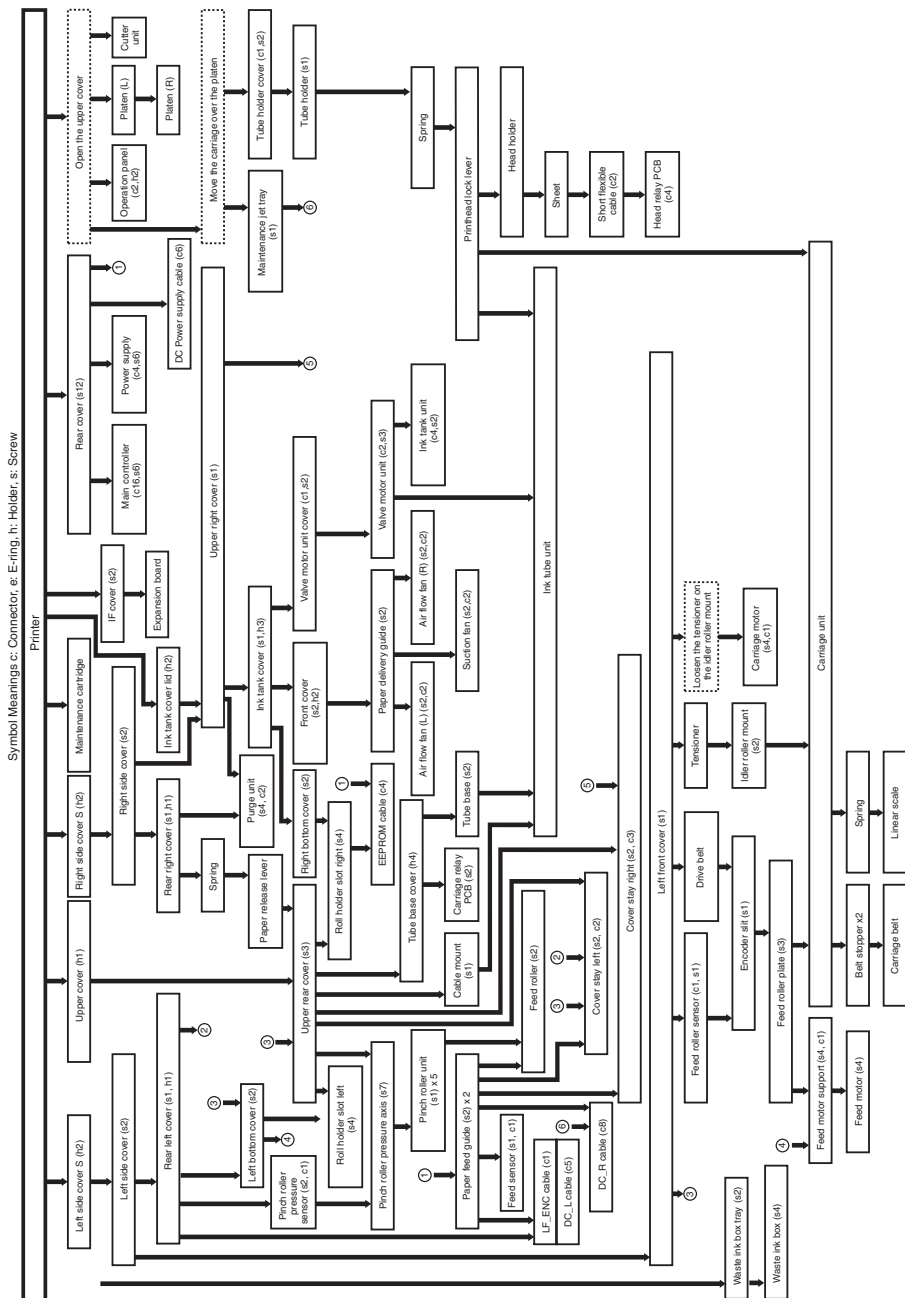
F-4-1

## 4.2 Disassembly/Reassembly

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### 4.2.1 Disassembly/Reassembly

The general disassembly and assembly flows of the major components are shown below.



## 4.3 Points to Note on Disassembly and Reassembly

---

### 4.3.1 Note on locations prohibited from disassembly

Locations that are prohibited from disassembly and cannot be adjusted outside of the factory have red screws instead of the regular-colored screws.



F-4-3

### 4.3.2 Manual carriage movement

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Move the carriage as necessary to keep it from coming into contact with any parts that may be removed during disassembly/reassembly.

The carriage is not movable while it is capped.

In this case, uncap the printer before moving it.

**See:**

See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drain > Open Cap/Shift Wiper Unit.

---

### 4.3.3 Units required for draining the ink

Before disassembling the units in the ink passage mentioned below, drain them of inks completely to prevent their leakage.

For instructions on how to drain units of inks, see Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drainage.

**[1] Ink Tube Unit**

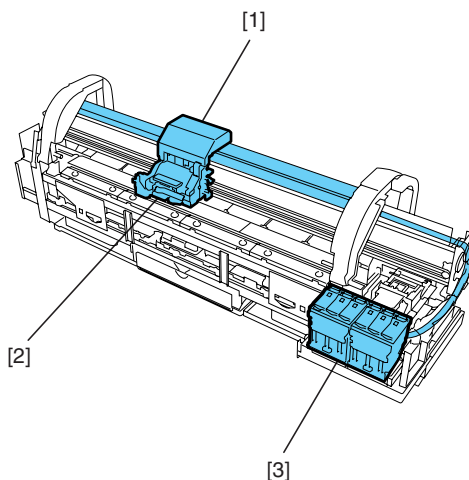
See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Tube Unit.

**[2] Carriage Unit/Head Holder**

See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Carriage unit.

**[3] Ink Tank Unit**

See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Tank Unit.

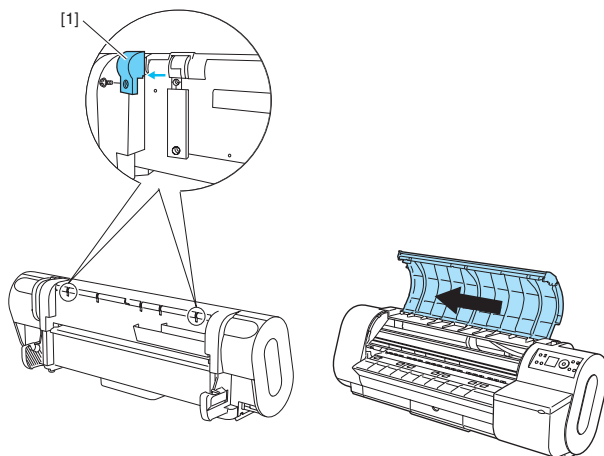


F-4-4

### 4.3.4 Outer covers

#### a. Upper cover

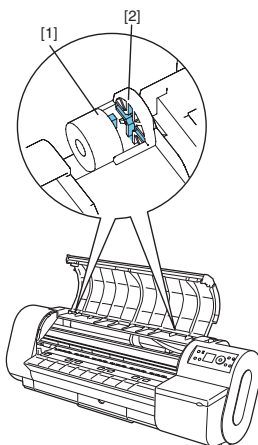
To detach the upper cover, detach damper cover [1] located on the left and right sides of the back each. Then, fully open the upper cover and slide it to left



F-4-5



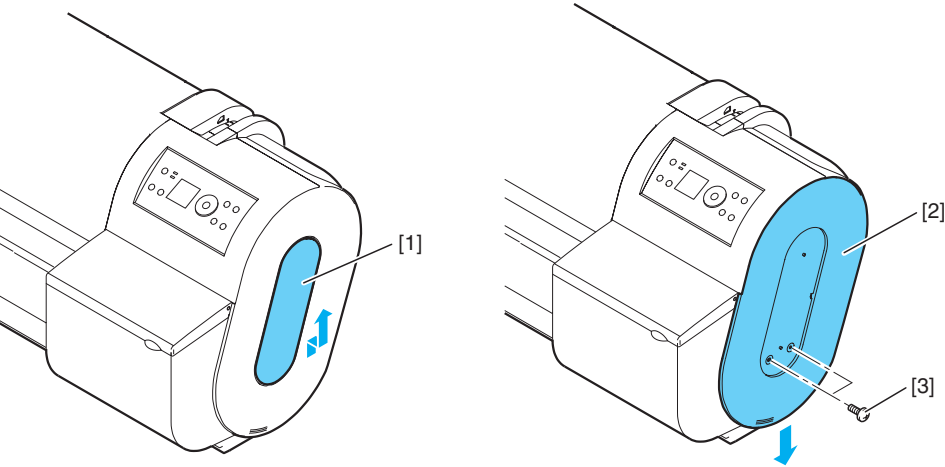
In attaching the upper cover, have the boss on damper [1] located on both sides into slit [2].  
If the upper cover is not attached in correct position, it would slam shut without the damper being activated.



F-4-6

**b. Right side and left side covers**

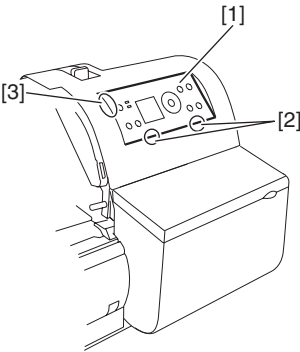
To detach a side cover, slide up side cover S [1] in the middle. Unscrew two screws[3] hidden under side cover S [1] and slide downside cover [2] to detach the slide cover.



F-4-7

**c. Operation panel**

To remove the operation panel, first open the top cover, insert your hand into the inside of the right upper cover from the left side and release two lower claws[2] securing operation panel [1] in position. Then, push out operation panel [1] to front to release it from upper three hooks. Then, remove the two connectors[3] from the back of operation panel [1] to which harnesses are attached.

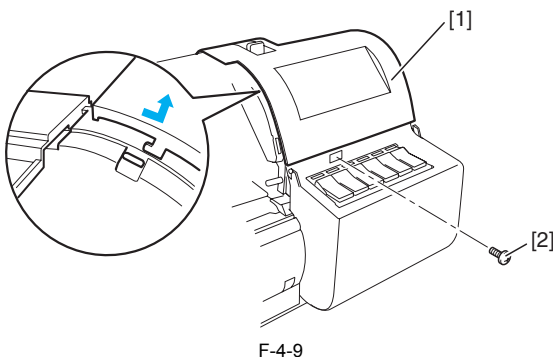


F-4-8



**d. Right upper cover**

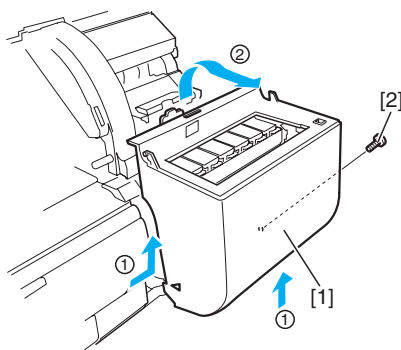
To detach the right upper cover[1], first open the top cover, remove the operation panel, right cover lid and right side cover, and then unscrew the front-panel screws[2]. Next, pull the right side of the right upper cover to front and slide it down out of position by lifting up the upper left edge of the cover.



Take maximum care in reinstalling the right upper cover not to interfere with the harnesses connected to the operation panel.

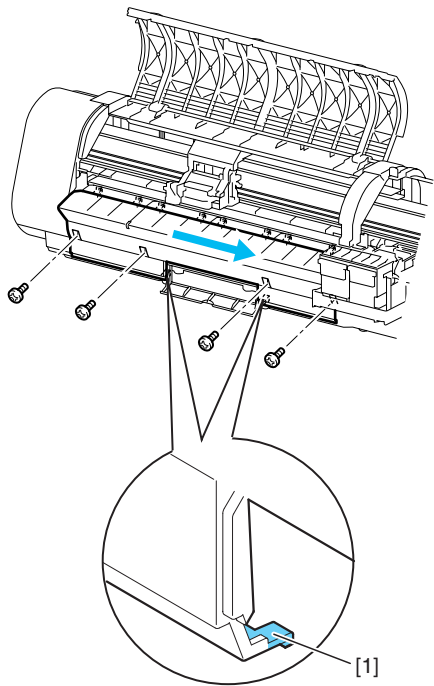
**e. Ink tank cover**

To detach the ink tank cover[1], remove the right side cover, right upper cover and ink tank cover lid and unscrew the front-panel screws[2]. Next, detach the right cover by lifting it up as a whole.



**f. Front cover**

To detach the front cover[1], the right cover needs to be removed and the maintenance cartridge cover opened beforehand so the front cover can be slid to right to remove.  
To do this, unscrew the four front-panel screws[2] and remove two bottom claws[3], and slide the front cover to right. Then, pull out the upper eight hooks to front to detach the front cover.

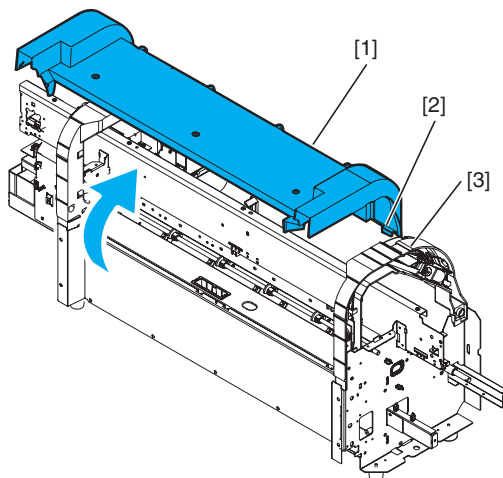


F-4-11

**g. Upper rear cover**

To detach the upper rear cover, first remove the top cover, the right rear cover and left front cover, left rear cover and paper release lever. Upper rear cover [1] has upper top claw [2] inserted into cover stay [3]. Rotate the upper edge of the upper rear cover about 90 degrees to detach it.

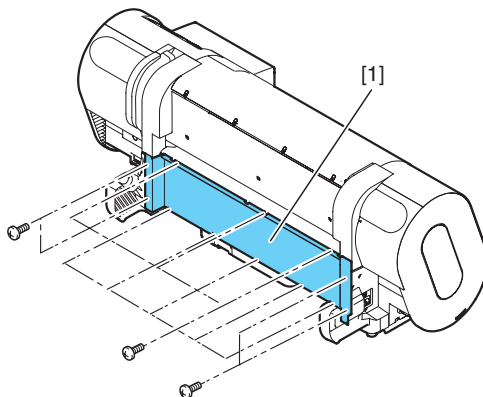
Attach the upper rear cover with claw [2] at its upper edge into cover stay [3] first.



F-4-12

**h. Rear cover**

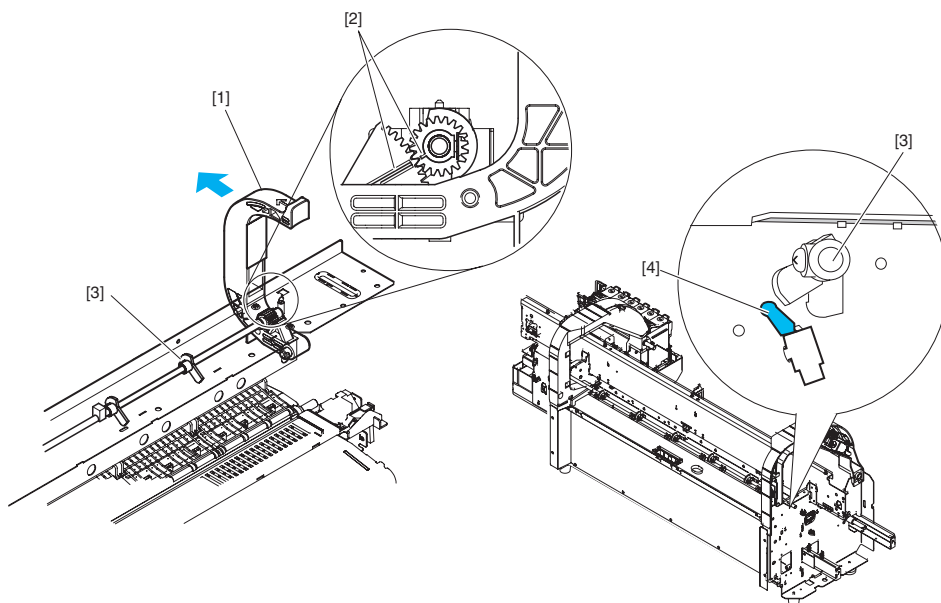
To detach rear cover [1], unscrew 12 screws and remove the cover from the bottom side first.



F-4-13

**i. Paper release lever**

To remove paper release lever [1], do so with the pinch roller pressurized. In assembling paper release lever [1] into position, align the gear of paper release lever [1] with the mark on the receiving gear (phase) [2].



F-4-14



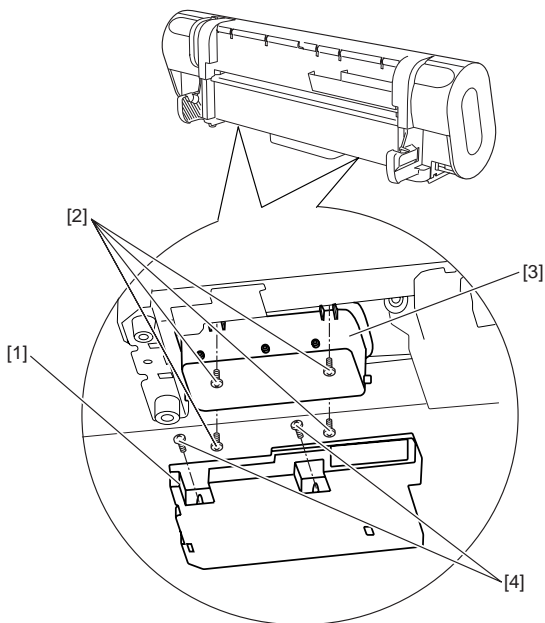
If pinch roller cam [3] has been overrun when paper release lever [1] is installed, remove cam sensor [4] and replace pinch roller cam [3] in original position.

If pinch roller cam [3] is replaced with cam sensor [4] in position, damage to cam sensor [4] could result.

### 4.3.5 Waste ink box

#### a. Removing the waste ink box

To remove the waste ink box, remove waste ink tray [1] from the back by unscrewing two screws[4]. Then, unscrew four screws[2] to remove waste ink box [3].

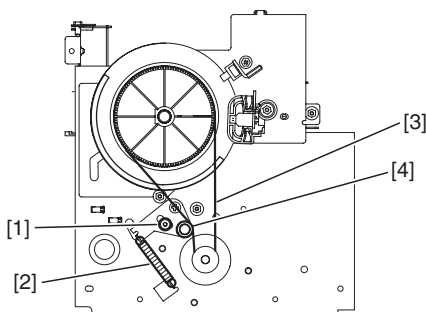


F-4-15

### 4.3.6 Driving unit

#### a. Timing belt (for driving the feed roller)

To assemble the timing belt for driving the feed roller, loosen the tensioner setscrew and establish the tension of the timing belt by adjusting the spring pressure. When the timing belt is assembled back in position, tighten the tension with the setscrew.



F-4-16

**b. Action following the replacement of the feed roller HP sensor and feed roller encoder**

This printer as shipped has the feed roller eccentricity (that is, variations in the rate of paper feed from rotation to rotation) corrected for enhanced media feed accuracy. When the feed roller, feed roller HP sensor or feed roller encoder pertaining to the correction of eccentricity variations has been replaced or disassembled and reassembled, therefore, the feed roller should require adjustment.

Execute service mode under the following conditions:

Service mode SERVICE MODE > ADJUST > PRINT PATTERN > LF

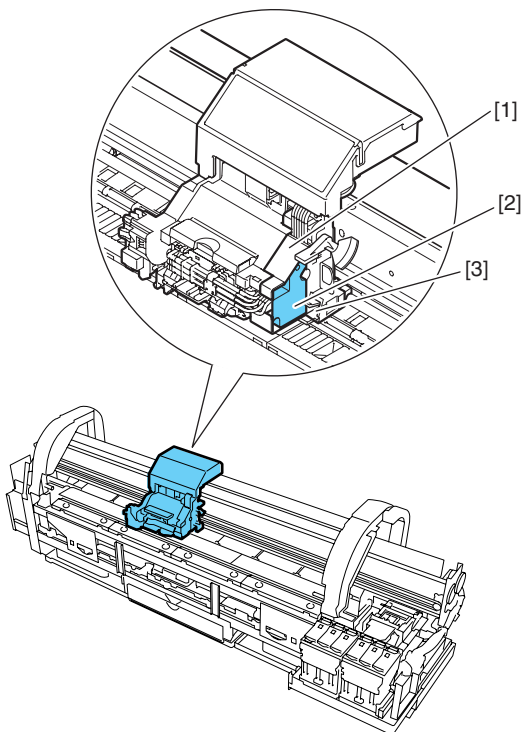
Carriage: LOW position

Media type: Gloss photo paper

Paper size: 36 inches

**4.3.7 Ink tube unit****a. Removing the ink tube unit**

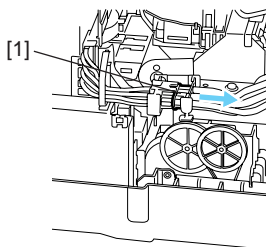
- (1) Drain the printer of inks. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drain.
- (2) Switch off the printer and move the carriage to above the platen. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Open Cap/Shift Wiper Unit.
- (3) Remove the shaft cleaner and detach the tube holder cover.



F-4-17

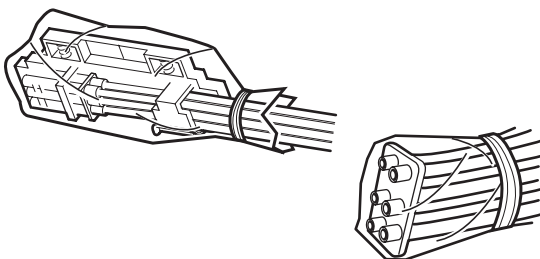
- (4) Disconnect three flexible cables from the main controller.
- (5) Remove the feed guide (right) that encloses the flexible cables extending from the main controller.
- (6) Disconnect all connectors from the carriage relay PCB.

- (7) Disconnect the joint between the ink tube unit and the ink tank unit.



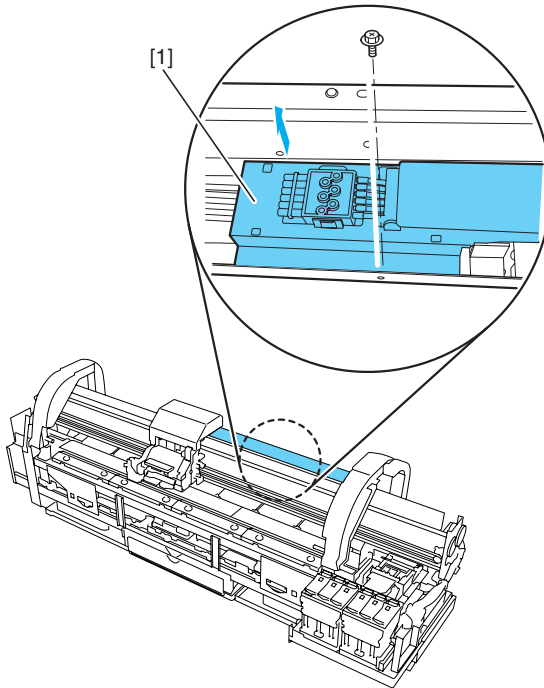
F-4-18

- (8) Remove the printhead.  
(9) Remove printhead fixer lever [1].  
(10) Cover the joint of the ink tube unit in a plastic bag or the like to prevent ink splashing and leakage, and seal the mouth of the bag.



F-4-19

- (11)Release the cable cover from its claw away from the frame.
- (12)Unscrew one screw and remove the cable clamp from the frame.



F-4-20

- (13)Release the ink tube unit from the carriage.

**b. Reassembling the ink tube unit**

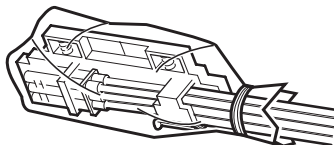
When the ink unit has been replaced, turn on the power switch without the printhead and the ink tanks mounted. Then, mount the printhead and ink tanks as directed by message guidance to fill the tanks.



### 4.3.8 Carriage unit

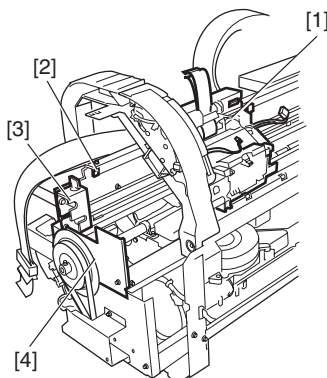
#### a. Removing the carriage unit

- (1) Drain the printer of inks. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drain.
- (2) Switch off the printer and move the carriage to above the platen. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Open Cap/Shift Wiper Unit.
- (3) Remove the shaft cleaner, tube holder cover and tube holder.
- (4) Remove the printhead.
- (5) Disconnect all connectors from the carriage relay PCB.
- (6) Remove the printhead fixer lever assembly.
- (7) Cover the printhead-side joint of the ink tube unit in a plastic bag or the like to prevent ink splashing and leakage, and seal the mouth of the bag.



F-4-21

- (8) Release the ink tube unit from the carriage.
- (9) Remove the pulley stand[3] and the feed roller plate[4], and release the carriage unit[1] from the left side of the printer.



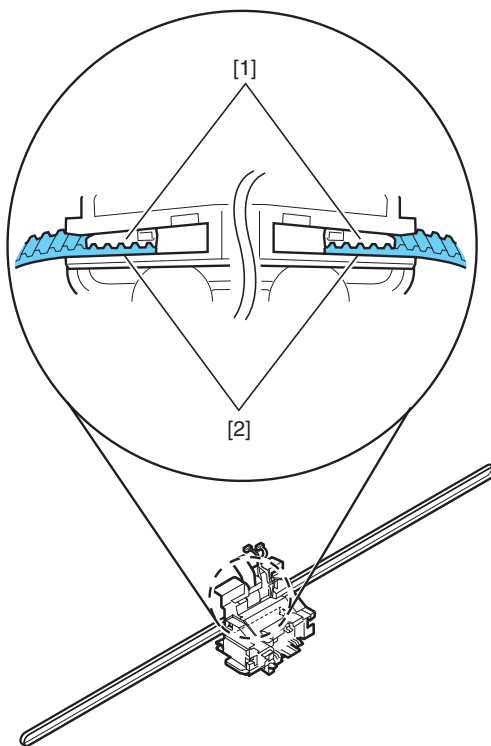
F-4-22



In removing the carriage unit, extract it level so that its protective mylar[2] sheets will not come off. If the protective mylar sheets should come off, the carriage unit rollers could come into contact with each other, rattling to or they could be damaged to degrade print quality.

**b. Installing the carriage belt**

Install the carriage belt[2] with its complete set of teeth engaged with carriage belt stopper[1].



F-4-23

**c. Action following the replacement of the carriage unit/multi sensor**

Because the distance between the multisensor (in the carriage unit) and the nozzles (in the printhead) is varied from one unit to another, the printer as shipped has its optical axis corrected to adjust the image write position. When the carriage unit or multisensor has been replaced or disassembled and reassembled, they require adjustment.

Execute service mode under the following conditions:

Service mode: SERVICE MODE > ADJUST > PRINT PATTERN > OPTICAL AXIS

Head height: LOW position

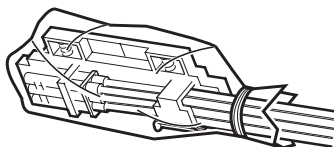
Media type: Gloss photo paper

Paper size: 36 inches

**d. Removing the head holder**

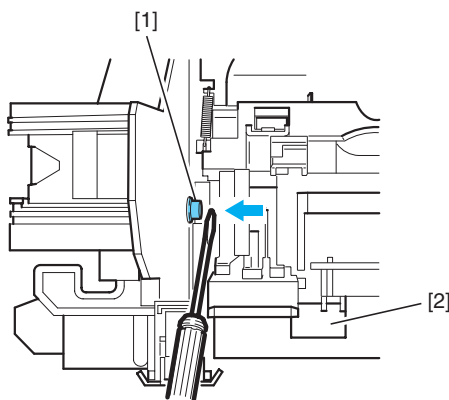
- (1) Drain the printer of inks. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drain.
- (2) Switch off the printer and move the carriage to above the platen. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Open Cap/Shift Wiper Unit.
- (3) Remove the shaft cleaner, tube holder cover and tube holder.
- (4) Remove the printhead.
- (5) Disconnect all connectors from the carriage relay PCB.
- (6) Release the two flexible cables from the carriage claws (to prevent the elevation and defective contact of the flexible cable on the head holder side).

- (7) Remove the printhead fixer lever assembly.
- (8) Cover the printhead-side joint of the ink tube unit in a plastic bag or the like to prevent ink splashing and leakage, and seal the mouth of the bag.

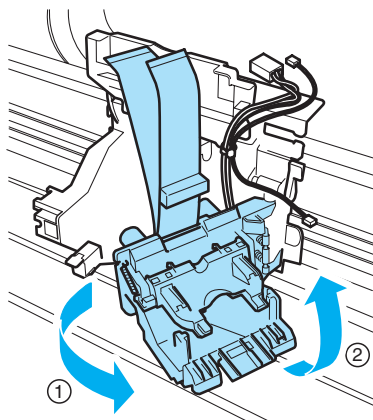


F-4-24

- (9) To remove the head holder, press the lock pin located rearward to its left with a flat-blade screwdriver or similar object in the direction of the arrow mark.



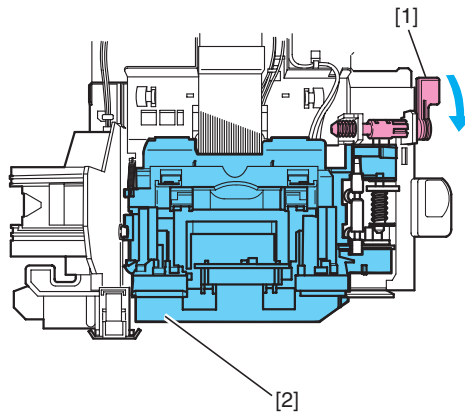
F-4-25



F-4-26

#### e. Reassembling the head holder

After the head holder has been reassembled, check that it lifts up and down in sync with the printhead height adjustment lever.



F-4-27

#### f. Multisensor correction

Because the mutisensor is varied from one unit to another, the printer as shipped has the sensor gain and color calibration adjusted for optical axis correction and paper gap calibration purposes. When the carriage unit or multisensor has been replaced or disassembled and reassembled, therefore, execute service mode under the following conditions:

\*If the carriage unit or the multisensor has been replaced, replace the multisensor standard at the same time.

-Service mode: SERVICE MODE > ADJUST > GAP CALIB

-Service mode: SERVICE MODE > ADJUST > SENSOR CALIB

Test chart: CL-7 (Tool No.: FY9-9323 \*Use a new chart form)

-Service mode: SERVICE MODE > ADJUST > PRINT PATTERN > OPTICAL AXIS

Media type: Gloss photo paper

Paper size: A2-width Paper or more

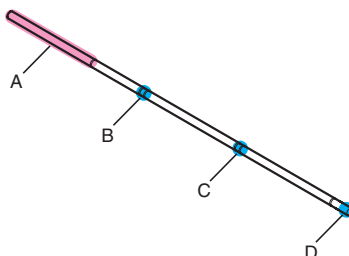
### 4.3.9 Feeder unit

#### a. Handling the feed roller



The feed roller is a functionally vital part. Observe these precautions when handling it:

- Do not handle the feed roller with one hand or deflect it.
- Do not touch the roller surface (coated side).
- Do not flaw or dent the roller surface.
- Hold the feed roller by two positions shown below: holding position A and one of holding positions B, C and D.



F-4-28

#### b. Action following the replacement of the feed roller

This printer as shipped has the feed roller eccentricity (that is, variations in the rate of paper feed from rotation to rotation) corrected for enhanced media feed accuracy. When the feed roller, feed roller HP sensor or feed roller encoder pertaining to the correction of eccentricity variations has been replaced or when the feed roller has been replaced or disassembled and reassembled, therefore, the feed roller should require adjustment. Execute service mode under the following conditions:

Service mode SERVICE MODE > ADJUST > PRINT PATTERN > LF TUNING

Carriage: LOW position

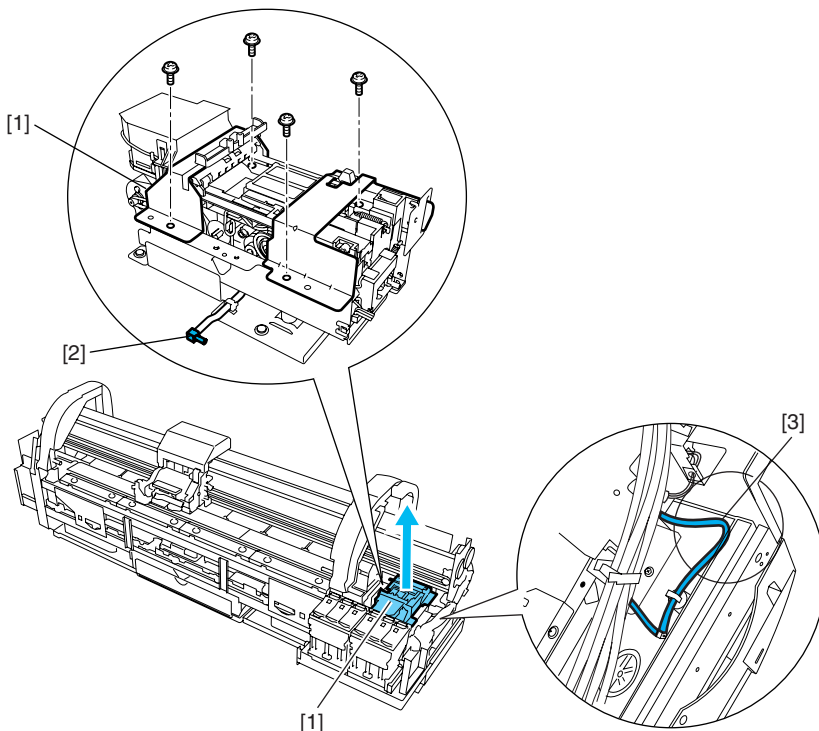
Media type: Gloss photo paper

Paper size: 36 inches

### 4.3.10 Purge unit

#### b. Removing the purge unit

- (1) Switch off the printer and move the carriage to above the platen. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Open Cap/Shift Wiper Unit.
- (2) Disconnect the ground wire from the side of the purge unit.
- (3) Remove the connector and release the harness from the harness guide.
- (4) Unscrew four screws and remove the waste ink tube joint, and then remove the purge unit.



F-4-29

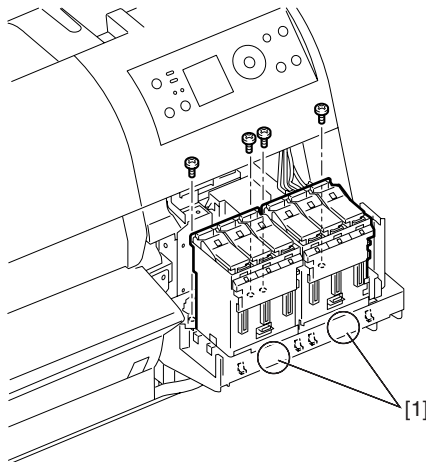


- Install the purge unit with care not to let the waste ink tube[3] bent.
- Exchange absorbents that exist under the purge unit at the same time when you exchange purge unit.

### 4.3.11 Ink tank unit

#### a. Removing the ink tank unit

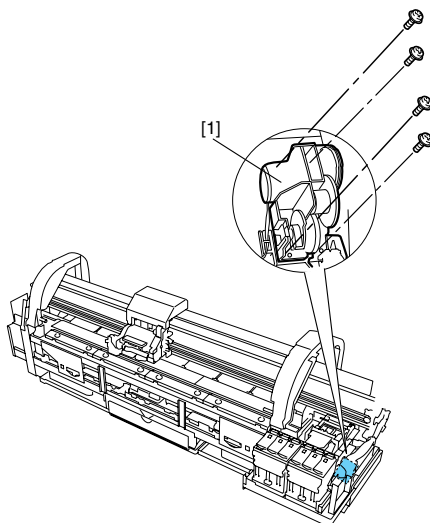
- (1) Drain the printer of inks. See Disassembly/Reassembly > Tips on Disassembly/Reassembly > Ink Drain.
- (2) Remove the joint between the ink tube unit and the ink tank unit.
- (3) Unscrew four ink tank unit screws and remove five connectors, and then remove the ink tank unit.



F-4-30

#### b. Removing the valve motor unit

- (1) Unscrew four screws and remove one screw, and then remove the valve motor unit.

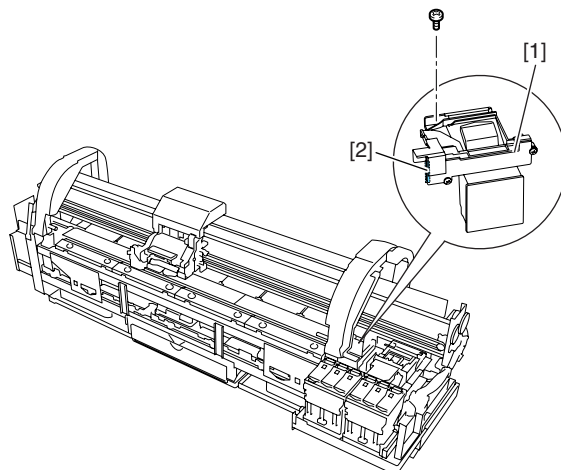


F-4-31

### 4.3.12 Head management sensor

#### a. Installing the head management sensor

(1) Attach the connector[2] to the head management sensor[1] and then set the head management sensor[1] where it is to be mounted and fasten it with screw.



F-4-32

#### b. Procedure after replacing the head management sensor

The optical axis is compensated at factory shipment in order to adjust the non-discharge detection position because there are fluctuations among machines in the distance between the head management sensor and carriage unit. Therefore, adjustment must be made when the head management sensor is replaced or disassembling/assembling components that may cause error in the distance between the head management sensor and carriage unit.

Enter the service mode as follows:

SERVICE MODE > ADJUST > NOZZLE CHK POS. > YES



### 4.3.13 multi sensor

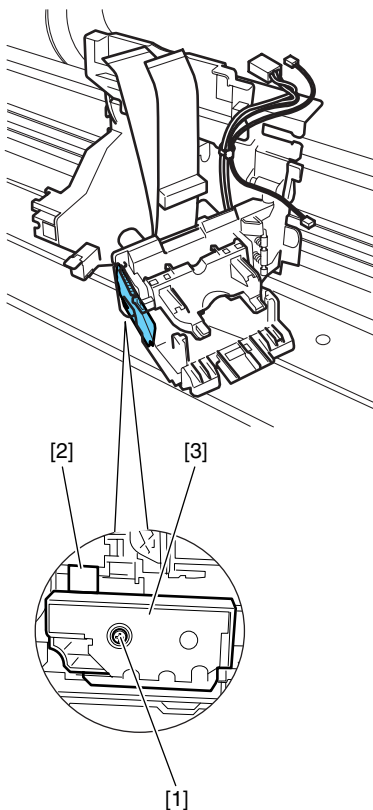
#### a) Removing the multi sensor

(1) The head holder is opened.

#### See:

"Disassembly/Reassembly" > "Points to Note on Disassembly/Reassembly" > "Carriage unit" > "d. Removing the head holder"

(2) Remove the screw[1], disconnect the flexible cable[2], and then remove the multi sensor[3].



F-4-33

Since multi sensors have individual electrical specificity, the following are recalibrated at the factory, namely, the optical axis of the sensor, the sensor gain for measuring the printhead height and color reproduction. Accordingly, carry out the following adjustments in the service mode whenever replacing the carriage unit or multi sensor.

\* The multi sensor reference plate must be replaced at the same time whenever the carriage or the multi sensor is being replaced.

\* When replacing the carriage unit, **refer to Adjustment and Setup > Procedure after Removing or Replacing the Carriage Unit.**

- Service mode : SERVICE MODE > ADJUST > GAP CALIB
- Service mode : SERVICE MODE > ADJUST > SENSOR CALIB  
Test chart : CL-7( Tool No. : FY9-9323 Use anew chart.)
- Service mode : SERVICE MODE > ADJUST > PRINT PATTERN > OPTICAL AXIS  
Media type : Photo glossy paper  
Media size : Media having a width equal to or larger than that of A1-size paper

### 4.3.14 PCBs

Do not replace the main controller PCB and maintenance cartridge relay PCB(ROM board) at the same time. These PCBs store important data such as settings and carriage drive time. Before replacement of either PCB, the data stored in it is moved to the other PCB through internal communication so that it can be taken over to the new PCB automatically. This is the reason why the two PCBs should not be replaced at the same time.

If you want to replace both PCBs at the same time, first carry out the procedure "a" and then carry out the procedure "b".

After replacing with the maintenance controller PCB or maintenance cartridge relay PCB which are supplied as service parts, check that the firmware is the latest version.

#### **a) Procedure for replacing the maintenance cartridge relay PCB(ROM board)**

- 1) Turn off the printer and unplug the power cord.
- 2) Replace the maintenance cartridge relay PCB.
- 3) Plug the power cord to the outlet, and then turn on the printer with the PAPER SOURCE button and INFORMATION button pressed down. (The printer will start up in the PCB Replacement mode.)
- 4) Check that "Initializing" appears on the display, and then release the buttons. (When the printer enters the PCB Replacement mode, the message lamp goes on.)
- 5) Wait until "REPLACE MODE" appears on the display.
- 6) Select "MC BOARD", and then press the ok button
- 7) Check that "TURN POWER OFF" appears on the display, and then turn off the printer.
- 8) Turn on the printer.
- 9) Check the firmware version. If the firmware is not the latest version, update.

#### **b) Procedure for replacing the main controller PCB**

- 1) Turn off the printer and unplug the power cord.
- 2) Replace the main controller PCB.
- 3) Plug the power cord to the outlet, and then turn on the printer with the PAPER SOURCE button and INFORMATION button pressed down. (The printer will start up in the PCB Replacement mode.)
- 4) Check that "Initializing" appears on the display, and then release the buttons. (When the printer enters the PCB Replacement mode, the message lamp goes on.)
- 5) Wait until "REPLACE MODE" appears on the display.
- 6) Select "CPU BOARD", and then press the ok button
- 7) Check that "TURN POWER OFF" appears on the display, and then turn off the printer.
- 8) Turn on the printer.
- 9) Check the firmware version. If the firmware is not the latest version, update.

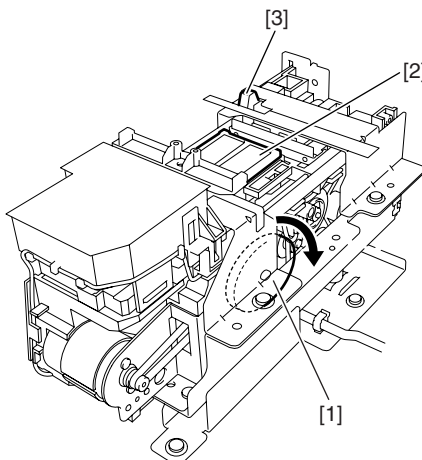
### 4.3.15 Opening the Caps and Moving the Wiper Unit

The procedures for manually opening the caps and ink supply valves are presented below.

The carriage lock pin and caps need to be released manually if moving the carriage when the power is turned off. For details on the sensors and flags, refer to TECHNICAL REFERENCE > Detection Functions Based on Sensors.

#### 1. Opening the caps and releasing the carriage lock pins

- 1) Remove the right side cover, right rear cover, and right upper cover.
- 2) Turn the gear[1] of the purge unit in the direction of the arrow. The cap[2] and lock pin[3] move down, allowing you to move the carriage.

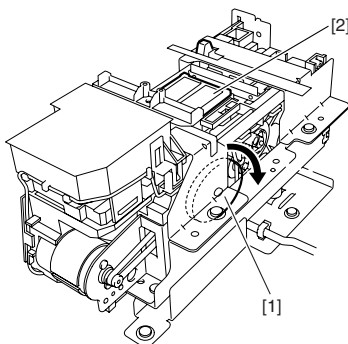


F-4-34

#### 2. Retracting the cap

If the purge unit cannot be removed because it is caught by the lower side of the cap[2] extending from the bottom of the purge unit, rotate the purge gear[1] of the purge unit as follows and retract the cap[2].

- 1) Remove the right side cover, right rear cover and right upper cover.
- 2) Rotate the purge gear[1] in the clockwise direction.



F-4-35

**MEMO:**

After opening the caps and removing the carriage lock pin, rotating the gear further will close the caps after the wiper unit has completed the return movement, and the carriage lock pin will rise and lock the carriage.

---

**3. Moving the wiper unit**

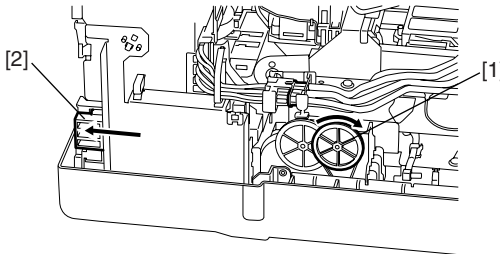
- 1) Remove the right side cover.
- 2) Rotate the purge gear in the clockwise direction, and then move the wiper unit.

**4.3.16 Opening/Closing the Ink Supply Valve**

- 1) Remove the right side cover.
  - 2) To open the ink supply valve, turn the cam[2] in the direction of the arrow and press the link[1].
- 



- If the tube is full of ink, releasing the printhead lock lever with the ink supply valve open can cause the ink to flow back to the ink supply unit, resulting in leakage of ink from the ink supply needle.
  - If the ink supply valve is held open due to a problem such as a valve motor error(E02D06), remove the valve motor unit(refer to DISASSEMBLY/REASSEMBLY > Points to Note on Disassembly and Reassembly > Ink Tank Unit) and close the ink supply valve.
- 



F-4-36

### 4.3.17 Draining the Ink

There are two methods of removing the ink, using a manual method or automatic method.  
When the ink is drained, the ink inside the ink passage totaling approximately is drained as waste ink.



To prevent ink leaks, be sure to always remove the ink inside the ink passage when disassembling or transporting the parts of the ink passage section.

#### 1. Automatic ink drainage

Automatic ink drainage is performed by going to the Main Menu and selecting "Maintenance" > "Move Printer". It takes about 4 minutes for automatic ink drainage to be performed.



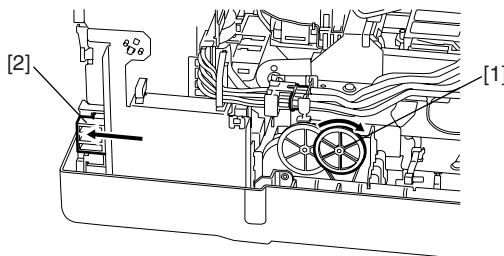
Perform automatic ink drainage again if a power outage or other cause shuts off the power during the operation for automatic ink drainage.

#### 2. Manual ink drainage

A syringe or other implement is used to remove the ink inside the ink passages one color at a time in the event of a printer electrical failure, firmware error, or malfunction in supplying power to the printer.

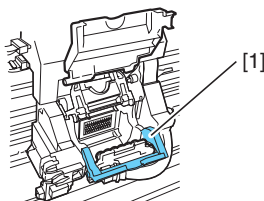
##### Manual Ink Drainage Procedure

- (1) Remove ink tank cover. Refer to "Disassembly/Reassembly" > "Point to Note on Disassembly and Reassembly" > "External cover"
- (2) Move the carriage onto the platen. Refer to "Disassembly/Reassembly" > "Point to Note on Disassembly and Reassembly" > "Opening the Cap/Move the Wiper Unit".
- (3) Turn the cam[1] in the direction of the arrow, and then press the link[2] to open the ink supply valve.



F-4-37

- 4) Release both printhead fixer levers[1] to flow the ink from inside the ink tube to the sub-buffer of the ink tank unit.




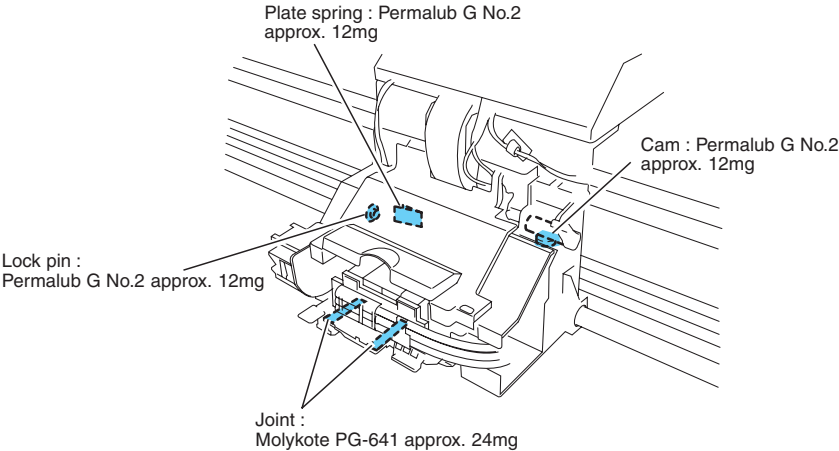
F-4-38

## 4.4 Applying the Grease

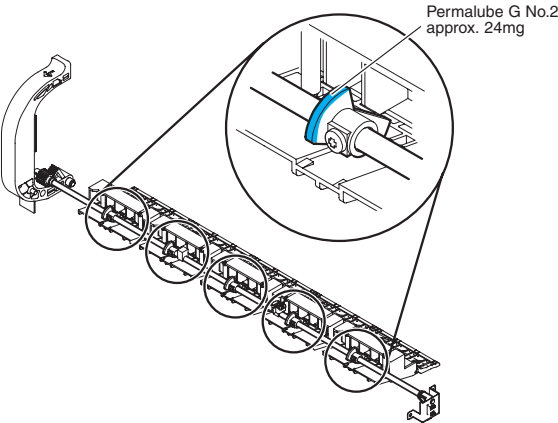
### 4.4.1 Applying The Grease

Apply the grease at the location shown below.  
Smear the grease lightly and evenly with a flat brush.

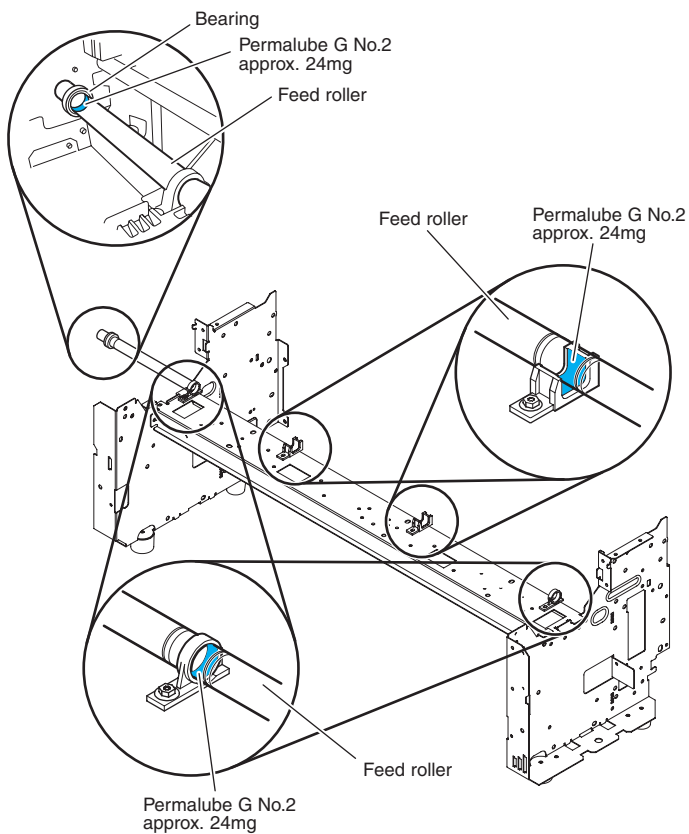
 Don't apply the grease to locations other than those designated. Unwanted grease may cause poor print quality, take particular care that grease does not get onto the wiper, cap, or the linear scale.



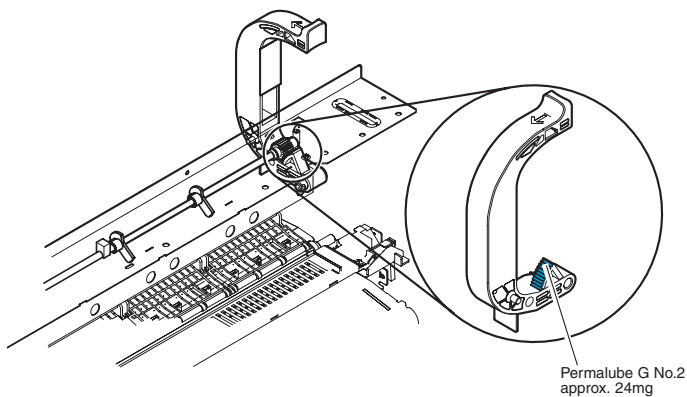
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F-4-42

## 4.5 Adjustment and Setup Items

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### 4.5.1 Procedure after Replacing the Feed Roller HP Sensor or Feed Roller Encoder

#### **Procedure after replacing the feed roller HP sensor or feed roller encoder**

Feed roller eccentricity is factory-adjusted (correction of variation in the paper feed amount per rotation). It is necessary to adjust feed roller eccentricity after replacing the feed roller HP sensor or feed roller encoder. In the service mode, perform automatic adjustment of feed roller eccentricity.

Service mode : SERVICE MODE > ADJUST > PRINT PATTERN > LF TUNING

Media type : Photo glossy paper

Media size : Media having awidth equal to or larger than that of A2-size paper

### 4.5.2 Procedure after Replacing the Carriage Unit or Multi Sensor

#### **a) Multi Sensor Recalibration**

Since multi sensors have individual electrical specificity, the following are recalibrated at the factory, namely, the optical axis of the sensor, the sensor gain for measuring the printhead height and color reproduction. Accordingly, carry out the following adjustments in the service mode whenever replacing the carriage unit or multi sensor.



The multi sensor reference plate must be replaced at the same time whenever the carriage or the multi sensor is being replaced.

-Service mode : SERVICE MODE > ADJUST > GAP CALIB

-Service mode : SERVICE MODE > ADJUST > SENSOR CALIB  
Test chart : CL-7( Tool No. : FY9-9323 Use anew chart.)

-Service mode : SERVICE MODE > ADJUST > PRINT PATTERN > OPTICAL AXIS  
Media type : Photo glossy paper  
Media size : Media having a width equal toor larger then that of A2-size paper

### 4.5.3 Procedure after Replacing the Head Management Sensor

Since the distance between the head management sensor and the carriage unit varies among printers, the optical axis is factory-adjusted to adjust the non-discharging detection position. When you have replaced the head management sensor or performed assembly/reassembly of surrounding parts that can change the distance between the head management sensor and the carriage unit, reasjustment is required  
Peform the readjustment in the service mode.

Service mode : SERVICE MODE > ADJUST > NOZZLE CHK POS.



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## Chapter 5

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# **MAINTENANCE**

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## 5.1 Periodic Replacement Parts

### 5.1.1 Periodic Replacement Parts

T-5-1

Level	Periodic Replacement part
User	None
Service Personnel	None

## 5.2 Consumable Parts

### 5.2.1 Consumable Parts

T-5-2

Level	Consumable		Durability (A0)	Remarks
	Description	part no		
User	-	-	-	See 1 2 6 "Consumable"
Service	WASTE INK TANK UNIT	QM3-1369-000	12000 Sheets	Unit A
	MIST FAN	QL2-1053-000	12000 Sheets	Unit A
	ABSORBER, DUCT	QC2-2999-000	12000 Sheets	Unit A
	SCALE, LINEAR	QC2-2697-000	12000 Sheets	Unit D
	CARRIAGE UNIT	QM3-1402-000	12000 Sheets	Unit D
	TUBE UNIT	QM3-1415-000	12000 Sheets	Unit F
	FLEXIBLE CABLE ASS'Y	QM3-1354-000	12000 Sheets	Unit F
	PURGE UNIT	QM3-1413-000	12000 Sheets	Unit H
	HEAD MANAGEMENT SENSOR UNIT	QM3-1395-000	12000 Sheets	Unit K
	MOTOR, CARRIAGE	QM3-1401-000	12000 Sheets	Unit M

## 5.3 Periodic Maintenance

### 5.3.1 Periodic Maintenance

T-5-3

Level	Periodic maintenance
User	Cleaning of ink mist and other substances
Service personnel	None

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## Chapter 6

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# **TROUBLESHOOTING**

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## 6.1 Troubleshooting

### 6.1.1 Outline

#### 6.1.1.1 Outline of Troubleshooting

##### 1. Overview

Targets of troubleshooting are classified into the troubles displayed on the LCD (i.e., warnings, errors, and service calls) and the troubles not displayed on the LCD.

Warnings and errors are displayed on the printer's LCD along with a code comprising alphanumeric characters.

##### 2. Precautions for Troubleshooting

- 1) Check the environmental conditions and the media used.
- 2) Before starting troubleshooting, check that the connectors and cables are connected properly.
- 3) If you repair the printer with its external panel detached without disconnecting the AC cord from the outlet, take great care to prevent electric shock and short-circuiting of PC boards.
- 4) Countermeasures to take after completion of troubleshooting are described starting with the most probable component that can cause the trouble determined by troubleshooting. If there are two or more equally probable components, countermeasures are described starting with the component that requires the easiest repair. After performing each countermeasure step, carry out test printing to check whether the problem has been solved. If not solved, try the next countermeasure step.
- 5) After completion of troubleshooting, check that all the necessary connectors and screws have been installed securely.
- 6) After completion of replacement or repair of a component, be sure to carry out test printing to make sure that the trouble has been solved.

### 6.1.2 Troubleshooting by the Phenomenon

#### 6.1.2.1 Incorrect Value Check Value

##### <Cause>

The value entered in "IP Address", "Subnet Mask", or "Default G/W" after selecting [Interface Setting]>[TCP/IP]>[IP Setting] is invalid.

##### <Probable fault location>

Operation method or Main Controller PCB

##### <Countermeasure>

- 1) Operation check  
Correct the value in "IP Address", "Subnet Mask", or "Default G/W" and check whether the message disappears.
- 2) Replace the Main Controller PCB.

#### 6.1.2.2 Load roll.

##### <Cause>

In the roll media mode, the media sensor detected absence of media.

##### <Probable fault location>

Operation method, media sensor, or main controller PCB

##### <Countermeasure>

- 1) Operation check  
Check the roll media to check whether the message changes.
- 2) Visual check  
Remove foreign substances from the feed roller if any.
- 3) Media sensor  
Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the media sensor.
- 4) Cable continuity check  
If continuity of the cable between the media sensor and the main controller PCB is abnormal, replace the cable.
- 5) Replace the main controller PCB.

### 6.1.2.3 Load sheets. /Remove sheets.

#### <Cause>

In the cut media mode, the media sensor detected absence of cut media.

When the cut media mode is switched to the roll media mode, the media sensor detected presence of paper.

#### <Probable fault location>

Operation method, media sensor, or main controller PCB

#### <Countermeasure>

1) Operation check

Check whether the message changes when cut media is loaded or unloaded.

2) Visual check

Remove foreign substances from the media sensor if any.

3) Media sensor

Select [SERVICE MODE]>[I/O DISPLAY] to check the operation. If the operation is abnormal, replacement is required.

4) Cable continuity check

If continuity of the cable between the media sensor and the main controller PCB is abnormal, replacement is required.

5) Replace the main controller PCB.

### 6.1.2.4 Open Ink Tank Cover

#### <Cause>

When the power is turned on, the machine detected absence of the tank.

#### <Probable fault location>

Operation method, ink tank, ink tank unit, or main controller PCB

#### <Countermeasure>

1) Operation check

Check whether the message changes when ink tanks of all colors are installed.

2) Visual check

Remove foreign substances from the contacts if any.

3) Cable continuity check

Check continuity of the cable between the ink tank and the main controller PCB. If it is abnormal, replace the cable.

4) Replace the ink tank.

5) Replace the ink tank unit.

6) Replace the main controller PCB.

### 6.1.2.5 The printer cannot be turned on.

#### <Example of symptom>

Nothing appears when the power button is pressed.

#### <Cause>

Improper connection of connector, defective power connector, defective power supply PCB, defective operation panel, or defective main controller PCB

#### <Countermeasure>

1) Power cord

Reconnect the power cord.

2) Connector check

Reconnect the connectors of the operation panel (J2), main controller (J1801,J2601), and power supply PCB (J1,J45).

3) Cable continuity check

If continuity of the cable between the operation panel and the main controller PCB is abnormal, replace the cable.

If continuity of the cable between the main controller PCB and the power supply PCB is abnormal, replace the



cable.

If continuity of the cable between the power supply PCB and the power supply connector is abnormal, replace the cable.

- 4) Replace the power supply PCB.
- 5) Replace the operation panel.
- 6) Replace the main controller PCB.

### 6.1.2.6 The printer is shut down during power-on or printing.

#### <Example of symptom>

The printer is shut down during power-on or printing.

#### <Cause>

Defective printhead, head relay PCB, or carriage relay PCB

#### <Countermeasure>

- 1) Replace the printhead.
- 2) Replace the head relay PCB.
- 3) Replace the carriage relay PCB.
- 4) Replace the main controller PCB.

### 6.1.2.7 The printer cannot be connected over the network.

#### <Example of symptom>

The printer cannot print over the network.

#### <Cause>

Defective cable, incompatible hub, or defective main controller PCB

#### <Countermeasure>

- 1) Cable check  
Reconnect the LAN cable.
- 2) Check communication settings.  
If the hub is incompatible, auto negotiation may fail.  
Select [Ethernet Driver] from the [Interface Setting] menu on the operation panel, and then set the network communication speed and transfer mode according to the hub specifications.
- 3) Replace the hub.  
Explain to the customer that the printer is normal.
- 4) Replace the main controller PCB.

### 6.1.2.8 Printing error (Ink remains.)

#### <Example of symptom>

Step 1

- The interface is not recognized.
- Test printing is normal but printing from the host computer is abnormal.

Step 2

- Nothing is printed.
- Both test printing and printing from the host computer are abnormal.
- Texture appears in the image.

#### <Cause>

Defective host computer, defective interface cable, extended interface board, dirty carriage rail, defective printhead, defective purge unit, defective linear scale, defective carriage unit, defective head relay PCB, defective carriage relay PCB, or defective main controller PCB

#### <Countermeasure against trouble in step 1 >

- 1) Interface cable  
Visually check the connector. If the connector is damaged or deformed, replace it.
- 2) Personal computer

Connect the personal computer in which the printer driver has been installed to the printer and check whether print data is transmitted normally. If print data is transmitted normally, explain to the customer that the personal computer needs to be replaced.

3) When an extended interface board (IEEE1394 board) is used, replace it.

4) Replace the main controller PCB.

### <Countermeasure against trouble in step 2>

1) Dirty carriage rail

Visually check the carriage rail, and remove foreign substances from the carriage rail if any.

2) Purge unit

Visually check the cap and wiper, and remove foreign substances from them if any.

3) Nozzle row alignment check

Select [Main menu]>[Print adjustment]>[Manual head alignment]>[Advanced adjustment] to align the nozzle rows.

Carry out mechanical slant adjustment.

4) Printhead

If the trouble persists after head cleaning, replace the printhead.

5) Linear scale

If the linear scale is dirty, clean it. If the trouble persists, replace the linear scale.

6) Replace the carriage relay PCB.

7) Replace the head relay PCB.

8) Replace the carriage unit.

9) Replace the main controller PCB.

## 6.1.2.9 Other printing errors

### <Example of symptom>

Stained media

### <Cause>

Media is stained with ink mist.

### <Countermeasure>

1) Clean the inner surface of the top cover or paper feed path using a well-wrung soft cloth.

## 6.1.3 Troubleshooting When Warnings Occur

### 6.1.3.1 Ink Level: Check(1000/1001/1002/1003/1006/1007)

No code number is displayed when a warning occurs. Selecting [SERVICE MODE] > [DISPLAY] > [WARNING] allows you to check the warning log.

### <Cause>

The electrode attached to the hollow needle in the ink tank unit detected that the ink level has lowered below the lower limit.

### <Probable fault location>

Ink tank, ink tank unit, or main controller

### <Countermeasure>

1) Check the ink level.

2) Replace the ink tank.

3) Check the connector of the ink tank unit.

4) Replace the main controller PCB.

### 6.1.3.2 Check maint cartridge capacity.(1100)

**<Cause>**

The machine has detected that the maintenance cartridge is nearly full of waste ink (about 80% of the total capacity of the maintenance cartridge).

**<Probable fault location>**

Maintenance cartridge or main controller

**<Countermeasure>**

- 1) Maintenance cartridge  
Select [SERVICE MODE]>[COUNTER]>[PRINTER]>[W-INK]. If the free space is nearly at the limit (0%), replace the maintenance cartridge.
- 2) Replace the main controller PCB.

### 6.1.3.3 End of paper feed. Cannot feed paper more. (100F)

**<Cause>**

In the manual feed mode, the main controller detected that the roll media had been fed by the maximum amount.  
Maximum backward feed amount: Printing standby position (on the feed roller)  
Maximum forward feed amount: Until the media sensor detects absence of roll media.

**<Probable fault location>**

Main controller

**<Countermeasure>**

- 1) Replace the main controller.

### 6.1.3.4 GARO W12xx (xx: Digits) (1221,1222,1223,1225,1231,1232,1233,1234,1235)

**<Cause>**

The GARO command in the received data was invalid.

**<Probable fault location>**

Operation method or main controller

**<Countermeasure>**

- 1) Check the operation method and retry printing.
- 2) Replace the main controller PCB.

## 6.1.4 Troubleshooting When Errors Occur

### 6.1.4.1 03010000-200C/03010000-2017/03010000-2018/03016000-2010 Multi sensor error

**<Cause>**

When media was fed, the multi sensor could not detect the media width.  
When the right edge of media was detected, the multi sensor detected that the media had been loaded at a wrong position.  
When the leading edge of media was to be detected, the multi sensor could not detect the leading edge of media.  
When media was fed, the multi sensor detected media smaller than the specified size.  
When media was fed, the multi sensor detected media larger than the specified size.  
When media was fed, the multi sensor detected skew greater than the specified one.  
When media was fed, the multi sensor could not detect the right edge of media.  
When media was fed, the multi sensor could not detect the left edge of media.

**<Probable fault location>**

Media, media loading method, paper path, multi sensor, head relay PCB, carriage relay PCB, or main controller PCB

**<Countermeasure>**

1) Media check

If there is any print or stain in the detection area on the media or the media size is not the specified one, replace the media.

2) Media loading position check

If the media loading position is wrong, load the media again.

3) Visual check

Remove foreign substances from multi sensor if any.

4) Multi-sensor

Select [SERVICE MODE]>[DISPLAY]>[SYSTEM]>[SIZE CR] to check the value read by the multi sensor.

If the value is wrong, replace the multi sensor.

5) Cable continuity check

If continuity of the cable between the multi sensor and the head replay PCB is abnormal, replace the cable.

6) Replace the head relay PCB.

7) Replace the carriage relay PCB.

8) Cable continuity check

If continuity of the cable between the carriage relay PCB and the main controller PCB is abnormal, replace the cable.

9) Replace the main controller PCB.

#### 6.1.4.2 03010000-200D Cut media end error

**<Cause>**

When cut media was fed by the specified length, the media sensor could not detect the trailing edge of the cut media.

During printing, the media sensor detected the trailing edge of the cut media at the position different from that detected during cut media feed.

**<Probable fault location>**

Paper path, media sensor, or main controller PCB

**<Countermeasure>**

1) Visual check

Remove foreign substances from the paper path and media sensor if any.

If the paper feed surface or moving part of the paper path is damaged or deformed, replace the paper path.

2) Media sensor

Check the media sensor for normal operation. If the operation is abnormal, replace the media sensor.

3) Cable continuity check

If continuity of the cable between the paper detection sensor and the main controller PCB is abnormal, replace the cable.

4) Replace the main controller PCB.

#### 6.1.4.3 03010000-2016 Paper feed/delivery jam error

**<Cause>**

During paper feed or delivery, paper jammed or paper was fed improperly.

During printing, paper was fed out of the way.

**<Probable fault location>**

Paper path, media sensor, or main controller PCB

**<Countermeasure>**

1) Visual check

Remove foreign substances from the paper path and media sensor if any.

If the paper feed surface or moving part of the paper path is damaged or deformed, replace the paper path.

2) Media sensor

Select [SERVICE MODE]>[I/O DISPLAY] to check the media sensor for normal operation. If the operation is abnormal, replace the media sensor.

3) Cable continuity check

If continuity of the cable between the media sensor and the main controller PCB is abnormal, replace the cable.

4) Replace the main controller PCB.

#### 6.1.4.4 03010000-2820/03010000-2821/03010000-2822/03010000-2823/03010000-2F33/031300312F32 Adjustment error

##### <Cause>

Auto head alignment selected from the user menu could not be carried out because the alignment pattern read result was NG.

Auto LF adjustment selected from the user menu or in the service mode could not be carried out because the adjustment pattern read result was NG.

Decentering correction selected in the service mode cannot be carried out because the correction pattern read result was NG.

Auto LF adjustment selected from the user menu or in the service mode could not be carried out because the head check pattern read result was NG.

Adjustment cannot be carried out because the loaded media is transparent.

Optical axis adjustment selected in the service mode cannot be carried out because the adjustment pattern read result was NG.



When adjustment has been carried out after selecting [SERVICE MODE]>[ADJUST]>[PRINT PATTERN]>[OPTICAL AXIS] or [SERVICE MODE]>[ADJUST]>[PRINT PATTERN]>[LF TUNING] in the service mode, check that photo glossy paper is used.

##### <Probable fault location>

Operation method, printhead, multi sensor, head relay PCB, carriage relay PCB, or main controller PCB

##### <Countermeasure>

1) Check whether the media type selected on the operation panel is the same as the type of the media used to print the adjustment pattern. If they are different, retry adjustment using the media of the type selected on the operation panel.

2) If ink bleeds greatly, change the media.

3) Carry out head cleaning, and retry adjustment. If the adjustment result is poor, replace the printhead.

4) Replace the multi sensor, and then retry adjustment.

5) Replace the head relay PCB.

6) Replace the carriage relay PCB.

7) Replace the main controller PCB.

#### 6.1.4.5 03010000-2E1F/03060000-2E14/03060A00-2E00/03061000-2E15/03860002-2E02/03860002-2E0A/03860002-2E0C Path mismatch error

##### <Cause>

The size of the media used to print the adjustment pattern was smaller than the specified one.

The media size specified using the driver was different from the size of the actually loaded media.

No roll media was loaded when data was received with roll media specified as a media type.

The type of the loaded media was different from the media type specified using the driver.

No cut media was loaded when data was received with cut media specified as a media type.

Data requiring roll media was received when cut media were loaded.

Data requiring cut media was received when roll media was loaded.

##### <Probable fault location>

Media type or main controller PCB

##### <Countermeasure>

1) Media check

Check the loaded media. If the media type is different from that required by the send data, no media is loaded, or the size of the loaded media is not the specified one, load correct media.

2) Replace the main controller PCB.

#### 6.1.4.6 03030000-2E21 IEEE1394 Error

**<Cause>**

The IEEE1394 interface is faulty.

**<Probable fault location>**

IEEE1394 interface board or main controller PCB

**<Countermeasure>**

1) Turn off the printer, and then turn it on again.

2) IEEE1394 interface board

Remove the IEEE1394 interface board, install it again, and then turn on the printer. If the trouble persists, replace the IEEE1394 interface board.

3) Replace the main controller PCB.

#### 6.1.4.7 03031000-2E0F Upper cover sensor error

**<Cause>**

The upper cover safety switch detected that the upper cover was open with the upper cover locked.

**<Probable fault location>**

upper cover, upper cover safety switch, upper cover lock, or main controller PCB

**<Countermeasure>**

1) Visual check

If the upper cover sensor flag or upper cover safety switch is damaged or deformed, replace it.

Remove foreign substances from the upper cover lock if any.

2) Upper cover safety switch

Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the upper cover switch.

3) Cable continuity check

If continuity of the cable between the upper cover safety switch and the main controller PCB is abnormal, replace the cable.

4) Upper cover lock

Check the upper cover lock for normal operation. If the operation is abnormal, replace the upper cover lock.

5) Cable continuity check

If continuity of the cable between the upper cover lock and the main controller PCB is abnormal, replace the cable.

6) Replace the main controller PCB.

#### 6.1.4.8 03031000-2E11 Carriage cover sensor error

**<Cause>**

The carriage cover sensor detected that the carriage cover was open with the upper cover locked.

**<Probable fault location>**

Operation method, carriage cover sensor, carriage relay PCB, or main controller PCB

**<Countermeasure>**

1) Operation check

Close the carriage cover tightly.

2) Visual check

If the carriage cover is damaged or deformed, replace it.

3) Carriage cover sensor

Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the carriage cover sensor.

4) Cable continuity check

If continuity of the cable between the carriage cover sensor and the carriage relay PCB is abnormal, replace the cable.

5) Replace the carriage relay PCB.

6) Cable continuity check

If continuity of the cable between the carriage relay PCB and the main controller PCB is abnormal, replace the cable.

7) Replace the main controller PCB.

#### 6.1.4.9 03031000-2E12 Defective paper release lever

##### <Cause>

The pressure release switch detected that the paper release lever was open with the upper cover locked.

##### <Probable fault location>

Operation method, pressure release switch, or main controller PCB

##### <Countermeasure>

1) Operation check

Close the paper release lever fully.

2) Visual check

If the paper release lever is damaged or deformed, replace it.

3) Pressure release switch

Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the pressure release switch.

4) Cable continuity check

If continuity of the cable between the pressure release switch and the main controller PCB is abnormal, replace the cable.

5) Replace the main controller PCB.

#### 6.1.4.10 03060A00-2E1B Roll media end error

##### <Cause>

During printing or roll media feed, the media sensor detected the end of the roll media.

##### <Probable fault location>

Roll media, media sensor, or main controller PCB

##### <Countermeasure>

1) Roll media

If roll media is used up, load new roll media.

2) Media sensor

Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the media sensor.

3) Cable continuity check

If continuity of the cable between the media sensor and the main controller PCB is abnormal, replace the cable.

4) Replace the main controller PCB.

#### 6.1.4.11 03130031-260E Gap detection error

##### <Cause>

A detection error occurred due to damaged hardware, uncorrected gap, or damaged correction data.

##### <Probable fault location>

Multi sensor or main controller PCB

##### <Countermeasure>

1) Cable continuity check

If continuity of the cable between the multi sensor and the main controller PCB is abnormal, replace the cable.

2) Replace the multi sensor.

3) Replace the main controller PCB.

#### 6.1.4.12 03130031-260F Gap adjustment error

**<Cause>**

Gap reference surface error (This error occurs only in the service mode.)

**<Probable fault location>**

Multi sensor base

**<Countermeasure>**

1) Replace the multi sensor base.

#### 6.1.4.13 03130031-2F13 A/D Converter external trigger output stopped

**<Cause>**

Defective main controller PCB

**<Probable fault location>**

Main controller PCB

**<Countermeasure>**

- 1) Turn off the printer, and then turn it off again.
- 2) Replace the main controller PCB.

#### 6.1.4.14 03130031-2F14 ASIC Register cannot be written.

**<Cause>**

A main controller PCB firmware error occurred.

**<Probable fault location>**

Main controller PCB

**<Countermeasure>**

- 1) Turn off the printer, and then turn it off again.
- 2) Replace the main controller PCB.

#### 6.1.4.15 03130031-2F16 Mist fan error

**<Cause>**

Mist fan rotation could not be detected during mist fan rotation.

**<Probable fault location>**

Mist fan or main controller PCB

**<Countermeasure>**

- 1) Replace the mist fan.
- 2) Cable continuity check  
If continuity of the cable between the mist fan and the main controller PCB is abnormal, replace the cable.
- 3) Replace the main controller PCB

#### 6.1.4.16 03130031-2F17 Suction fan error

**<Cause>**

When the suction fan was driven, the lock signal was detected for more than the specified time.

**<Probable fault location>**

Suction fan or main controller PCB

**<Countermeasure>**



## 1) Suction fan

Select [SERVICE MODE]>[FUNCTION]>[PLATEN FAN] to check the suction fan for normal operation. If the operation is abnormal, replace the suction fan.

## 2) Cable continuity check

If continuity of the cable between the suction fan and the main controller PCB is abnormal, replace the cable.

## 3) Replace the main controller PCB.

#### 6.1.4.17 03130031-2F20/03130031-22/03130031-2F23/03130031-2F28/03130031-2F2D Defective sensor in purge unit

## &lt;Cause&gt;

The pump cam sensor in the purge unit could not detect the home position of the purge motor within the specified time.

## &lt;Probable fault location&gt;

Purge unit or main controller PCB

## &lt;Countermeasure&gt;

## 1) Cable continuity check

If continuity of the cable between the pump cam sensor or purge motor and the main controller PCB is abnormal, replace the cable.

## 2) Replace the purge unit.

## 3) Replace the main controller PCB.

#### 6.1.4.18 03130031-2F25 Carriage home position error

## &lt;Cause&gt;

The carriage home position could not be detected within the specified time.

## &lt;Probable fault location&gt;

Carriage stopper, linear scale, linear encoder, or main controller PCB

## &lt;Countermeasure&gt;

## 1) Visual check

Remove foreign substances from the carriage stopper, linear scale, and linear encoder if any.

## 2) Replace the linear scale.

## 3) Replace the linear encoder.

## 4) Replace the main controller PCB.

#### 6.1.4.19 03130031-2F26/03130031-2F27 Carriage motor error

## &lt;Cause&gt;

The carriage did not operate because the carriage motor was overloaded due to a physical cause such as a jam. The carriage motor did not reach the specified speed within the specified time.

## &lt;Probable fault location&gt;

Carriage pathway, carriage rail, carriage belt, linear scale, linear encoder, carriage motor, carriage relay PCB, or main controller PCB

## &lt;Countermeasure&gt;

## 1) Carriage pathway check

Remove foreign substances (jammed paper) from the carriage pathway if any.

## 2) Carriage rail

Visually check whether the carriage rail is dirty. If the carriage rail is dirty, clean it using rail cleaner.

## 3) Carriage belt

Visually check whether the carriage belt is loose. If the carriage belt is loose, remove it and then reinstall it.

## 4) Replace the linear scale.

## 5) Replace the linear encoder.

## 6) Cable continuity check

If continuity of the cable between the linear encoder and the carriage relay PCB is abnormal, replace the cable.

- 7) Replace the carriage motor.
- 8) Cable continuity check  
If continuity of the cable between the carriage motor and the main controller PCB is abnormal, replace the cable.
- 9) Replace the carriage relay PCB.
- 10) Cable continuity check  
If continuity of the cable between the carriage relay PCB and the main controller PCB is abnormal, replace the cable.
- 11) Replace the main controller PCB.

#### 6.1.4.20 03130031-2F2A Feed roller home position error

**<Cause>**

During power-on, the feed roller HP sensor could not detect that the reference of Scale that exists on encoder film area color change from transparent to black.

**<Probable fault location>**

Encoder film, feed roller HP sensor, feed motor, or main controller PCB

**<Countermeasure>**

- 1) Visual check  
If the feed roller encoder film is damaged, replace it. Remove foreign substances from the feed roller encoder film if any.
- 2) Feed roller HP sensor  
Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the feed roller HP sensor.
- 3) Cable continuity check  
If continuity of the cable between the feed roller HP sensor or feed motor and the main controller PCB is abnormal, replace the cable.
- 4) Replace the feed motor.
- 5) Replace the main controller PCB.

#### 6.1.4.21 03130031-2F3A valve open/close error

**<Cause>**

When the ink supply valve opened or closed, valve open/closed detection sensor could not detect the valve cam rotation.

**<Probable fault location>**

Valve open/closed detection sensor, valve motor, or main controller PCB

**<Countermeasure>**

- 1) Visual check  
Remove foreign substances from the motor, gear, and sensor of the valve open/close mechanism if any.
- 2) Valve open/closed detection sensor  
Select [SERVICE MODE]>[I/O DISPLAY] to check for normal operation. If the operation is abnormal, replace the valve open/closed detection sensor.
- 3) Valve motor  
Select [SERVICE MODE]>[FUNCTION]>[INK VALVE] to check for normal operation. If the operation is abnormal, replace the valve motor.
- 4) Cable continuity check  
If continuity of the cable between the valve open/closed detection sensor or valve motor and the main controller PCB is abnormal, replace the cable.
- 5) Replace the main controller PCB.

#### 6.1.4.22 03800200-2802/03800400-2803/03800300-2801 Printhead error

**<Cause>**

Improper installation of the printhead was detected.  
A checksum error was detected in the EEPROM of the printhead.  
Printhead DI correction failed.

**<Probable fault location>**

Printhead, head relay PCB, carriage relay PCB, carriage unit, or main controller PCB

**<Countermeasure>**

1) Replace the printhead.

2) Head relay PCB

3) Cable continuity check

If continuity of the cable between the carriage relay PCB and the main controller PCB is abnormal, replace the cable.

4) Replace the carriage relay PCB.

5) Replace the carriage unit

6) Replace the main controller PCB.

#### 6.1.4.23 03800500-280C Defective printhead nozzle

**<Cause>**

Many non-discharging nozzles were detected.

**<Probable fault location>**

Printhead or head management sensor

**<Countermeasure>**

1) Clean the printhead.

2) Replace the printhead.

3) Replace the head management sensor.

#### 6.1.4.24 03800500-2F2F/03800500-2F30 Head management sensor error

**<Cause>**

The head management sensor detected an ink discharge error.

A sensor sensitivity error was detected during head management sensor position adjustment.

**<Probable fault location>**

Print head, head management sensor, or main controller PCB

**<Countermeasure>**

1) Replace the print head.

2) Visual check

Remove foreign substances from the head management sensor if any.

3) Replace the head management sensor.

4) Cable continuity check

If continuity of the cable between the head management sensor and the main controller PCB is abnormal, replace the cable.

5) Replace the main controller PCB.

#### 6.1.4.25 03810101-2501/03810102-2502/03810103-2503/03810104-2500/03810106-2506/03810106-2507 No ink error

**<Cause>**

No ink status was detected in the ink tank.

**<Probable fault location>**

Ink tank, ink tank unit, or main controller PCB

**<Countermeasure>**

1) Replace the ink tank.

2) Replace the ink tank unit.

3) Replace the main controller PCB.

6.1.4.26 03810201-2581/03810202-2582/03810203-2583/03810204-2580/03810206-2586/03810206-2587 Tank level error 1

**<Cause>**

When head cleaning was executed automatically at ink level 1, insufficiency of ink was detected.

---



Opening the ink tank cover recovers this error. The error recovery operation is continued until it is cancelled using the STOP key.

---

**<Probable fault location>**

Ink tank, ink tank unit, or main controller PCB

**<Countermeasure>**

- 1) Replace the ink tank.
- 2) Cable continuity check  
If continuity of the cable between the ink tank and the main controller PCB is abnormal, replace the cable.
- 3) Replace the ink tank unit.
- 4) Replace the main controller PCB.

6.1.4.27 03810201-2591/03810202-2592/03810203-2593/03810204-2590/03810206-2596/03810206-2597 Tank level error 2

**<Cause>**

When head cleaning was executed by the user at ink level 1, insufficiency of ink was detected.

---



Opening the ink tank cover recovers this error. The error recovery operation is continued until it is cancelled using the STOP key.

---

**<Probable fault location>**

Ink tank, ink tank unit, or main controller PCB

**<Countermeasure>**

- 1) Replace the ink tank.
- 2) Cable continuity check  
If continuity of the cable between the ink tank unit and the main controller PCB is abnormal, replace the cable.
- 3) Replace the ink tank unit.
- 4) Replace the main controller PCB.

6.1.4.28 03830101-2521/03830102-2522/03830103-2523/03830104-2520/03830106-2526/03830105-2527 Ink tank is not installed. ( This error occurs when the ink tank is replaced.)

**<Cause>**

When the ink tank was replaced, the closed state of the ink cover was detected with the ink tank removed.

**<Probable fault location>**

Operation method, ink tank, ink tank cover switch, ink tank unit, or main controller PCB

**<Countermeasure>**

- 1) Operation check

Install the ink tank.

2) Visual check

Remove foreign substances from the ink tank contacts and ink cover switch if any.

3) Replace the ink tank.

4) Ink tank cover switch

Check for normal operation. If the operation is abnormal, replace the ink tank cover switch.

5) Cable continuity check

If continuity of the cable between the ink tank cover switch and the main controller PCB is abnormal, replace the cable.

6) Replace the ink tank unit.

7) Cable continuity check

If continuity of the cable between the ink tank unit and the main controller PCB is abnormal, replace the cable.

8) Replace the main controller PCB.

#### 6.1.4.29 03830201-2541/03830202-2542/03830203-2543/03800204-2540/03830206-2546/03830206-2547 Invalid ink tank ID

##### <Cause>

The installed ink tank is wrong.

##### <Probable fault location>

Ink tank, ink tank unit, or main controller PCB

##### <Countermeasure>

1) Replace the ink tank.

2) Replace the ink tank unit.

3) Replace the main controller PCB.

#### 6.1.4.30 03830301-2561/03830302-2562/03830303-2563/03830304-2560/03830306-2566/03830306-2567 Ink tank EEPROM error

##### <Cause>

An ink tank EEPROM checksum error was detected.

##### <Probable fault location>

Ink tank, ink tank unit, or main controller PCB

##### <Countermeasure>

1) Replace the ink tank.

2) Replace the ink tank unit.

3) Cable continuity check

If continuity of the cable between the ink tank unit and the main controller PCB is abnormal, replace the cable.

4) Replace the main controller PCB.

#### 6.1.4.31 03841001-2819/03841001-281B/03841101-2818/03841201-2816/03841201-2817 Maintenance cartridge error

##### <Cause>

The maintenance cartridge is full.

The maintenance cartridge does not have the free space for various types of cleaning.

No maintenance cartridge is installed.

The EEPROM of the maintenance cartridge is abnormal.

A maintenance cartridge ID error occurred.

##### <Probable fault location>

Maintenance cartridge, maintenance cartridge relay PCB, or main controller PCB

##### <Countermeasure>

1) Replace the maintenance cartridge.

2) Replace the maintenance cartridge relay PCB.

3) Cable continuity check

If continuity of the cable between the maintenance cartridge relay PCB and the main controller PCB is abnormal, replace the cable.

4) Replace the main controller PCB.

#### 6.1.4.32 03861001-2405/03861001-2406 Borderless printing error

##### <Cause>

The position where the media is loaded is not suitable for borderless printing.

The received data is not suitable for borderless printing.

##### <Probable fault location>

Operation method

##### <Countermeasure>

1) Check the operation method and retry printing.

#### 6.1.4.33 03862000-2E09 Insufficient roll media error

##### <Cause>

The machine detected that the remaining roll media was insufficient.

##### <Probable fault location>

Roll media, feed roller HP sensor, feed roller encoder film, feed roller encoder, or main controller PCB

##### <Countermeasure>

1) Replace the roll media.

2) Feed roller HP sensor

Check for normal operation. If the operation is abnormal, replace the feed roller HP sensor.

3) Replace the feed roller encoder film.

4) Replace the feed roller encoder.

5) Replace the main controller PCB.

#### 6.1.4.34 03870001-2015 Cutter error

##### <Cause>

After roll media cutting, the multi-sensor could not detect the media end.

##### <Probable fault location>

Media, defective multi sensor, cutter unit, head relay PCB, or main controller PCB

##### <Countermeasure>

1) Media check

If there is any print or stain in the detection area on the media or the media size is not the specified one, replace the media.

2) Multi sensor

Select [SERVICE MODE]>[DISPLAY]>[SYSTEM]>[SIZE CR] to check the value read by the multi sensor.

If the value is wrong, replace the multi sensor.

3) Visual check

Remove foreign substances from the multi sensor and cutter unit if any.

If the cutter unit is damaged or deformed, replace it.

4) Cable continuity check

If continuity of the cable between the multi sensor and the head relay PCB is abnormal, replace the cable.

5) Replace the head relay PCB.

6) Replace the carriage relay PCB.

7) Replace the main controller PCB.

#### 6.1.4.35 03900001-4042/03900001-4049 Firmware error

**<Cause>**

Firmware cannot be recognized.  
The firmware is for another model.

**<Probable fault location>**

Firmware or main controller PCB

**<Countermeasure>**

- 1) Firmware  
Check the version of the transferred firmware and the compatible models.
- 2) Replace the main controller PCB.

#### 6.1.4.36 E194-4034 Sensor calibration error

**<Cause>**

Sensor calibration failed.

**<Probable fault location>**

Multi sensor, multi sensor base, head relay PCB, carriage relay PCB, or main controller PCB

**<Countermeasure>**

- 1) Retry calibration in the service mode.
- 2) Visual check  
Remove foreign substances from the multi sensor base if any.
- 3) Replace the multi sensor.
- 4) Cable continuity check  
If continuity of the cable between the multi sensor and the head relay PCB is abnormal, replace the cable.
- 5) Replace the head relay PCB.
- 6) Replace the carriage relay PCB.
- 7) Cable continuity check  
If continuity of the cable between the carriage relay PCB and the main controller PCB is abnormal, replace the cable.
- 8) Replace the main controller PCB.

### 6.1.5 Troubleshooting When Service Call Errors Occur

#### 6.1.5.1 E141-4046 Recovery system's rotation count reached 50,000

**<Cause>**

The machine detected that the rotation count of the purge unit reached the specified value.

**<Probable fault location>**

Purge unit or main controller PCB

**<Countermeasure>**

- 1) Replace the purge unit.  
After replacing the purge unit, select [SERVICE MODE]>[INITIALIZE]>[PARTS COUNTER] to reset the counter.
- 2) Replace the main controller PCB.

#### 6.1.5.2 E144-4047 Supply system's count error

**<Cause>**

The machine detected that the carriage scan count reached the specified value.

**<Probable fault location>**

Ink tank, tube unit, or main controller PCB

**<Countermeasure>**

1) Replace the ink tank unit and tube unit.

After replacing the ink tank and tube unit, select [SERVICE MODE]>[INITIALIZE]>[PARTS COUNTER] to reset the counter.

2) Replace the main controller PCB.

### 6.1.5.3 E146-4001 Borderless/idle ejection/mist collection count full

**<Cause>**

The machine detected that the waste ink box or the mist fan unit became full of ink.

**<Probable fault location>**

Waste ink box, mist fan unit, or main controller PCB

**<Countermeasure>**

1) Replace the waste ink box or mist fan unit.

After replacing the waste ink box or mist fan unit, select [SERVICE MODE]>[INITIALIZE]>[PARTS COUNTER] to reset the counter.

2) Replace the main controller PCB.

### 6.1.5.4 E161-403E Abnormally high head temperature

**<Cause>**

The printhead temperature became abnormally high.

**<Probable fault location>**

Printhead, head relay PCB, carriage relay PCB, or main controller PCB

**<Countermeasure>**

1) Start up the printer in the service mode, and then replace the printhead.

2) Replace the head relay PCB.

3) Replace the carriage PCB.

4) Replace the main controller PCB.

### 6.1.5.5 E194-404A Non-discharge detection count error

**<Cause>**

The machine detected that the non-discharge count reached the specified value.

**<Probable fault location>**

Head management sensor or main controller PCB

**<Countermeasure>**

1) Replace the head management sensor.

After replacing the head management sensor, select [SERVICE MODE]>[INITIALIZE]>[PARTS COUNTER] to reset the counter.

2) Replace the main controller PCB.

### 6.1.5.6 E196-4040/E196-4041/E196-4042/E196-4043/E196-4044/E196-4045 Main controller PCB error

**<Cause>**

The main controller PCB is defective.

**<Probable fault location>**



Firmware or main controller PCB

**<Countermeasure>**

- 1) Upgrade the firmware.
- 2) Replace the main controller PCB.

### 6.1.5.7 E198-401C/E198-401D/E198-401E RTC error

**<Cause>**

The RTC of the main controller is not found.  
The battery capacity is low.

**<Probable fault location>**

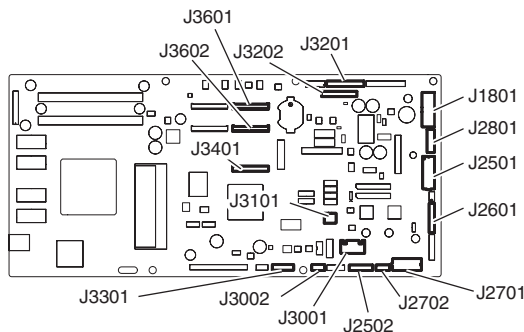
Lithium battery or main controller

**<Countermeasure>**

- 1) Start up the printer in the service mode, and then turn off the power.
- 2) Replace the lithium battery.
- 3) Replace the main controller

## 6.2 Location of Connectors and Pin Arrangement

### 6.2.1 Main controller PCB



F-6-1

T-6-1

J1801			
Pin Number	Signal name	IN/OUT	Function
1	RGV20(+5V)	IN	Power supply (+5V)
2	RGV20(+5V)	IN	Power supply (+5V)
3	RGV20(+5V)	IN	Power supply (+5V)
4	GND	-	GND
5	GND	-	GND
6	GND	-	GND
7	VM	IN	Power supply (+32V)

J1801			
Pin Number	Signal name	IN/OUT	Function
8	VM	IN	Power supply (+32V)
9	VMGND	-	GND
10	VMGND	-	GND
11	VM_ENB	OUT	VM enable signal
12	AFCONT	OUT	Normal/power saving switch signal

T-6-2

J2501			
Pin Number	Signal name	IN/OUT	Function
A1	N.C	-	N.C
A2	N.C(GND)	-	N.C
A3	N.C(LIFT_CAM)	-	N.C
A4	SNS3V	OUT	Power supply (+3.3V)
A5	GND	-	GND
A6	/CRHP	IN	Lift cam sensor output signal
A7	LIFTM_VM	OUT	Power supply (+32V)
A8	LIFTM0_A	OUT	Lift motor Drive signal A
A9	LIFTM2_AX_N0	OUT	Lift motor Drive signal AX
A10	LIFTM1_B	OUT	Lift motor Drive signal B
A11	LIFTM3_BX_N1	OUT	Lift motor Drive signal BX
A12	/ATUKAIJYO	IN	Pressure release switch output signal
A13	GND	-	GND
B1	PUMPM1_AM	OUT	Pump motor Drive signal AM
B2	PUMPM1_AP	OUT	Pump motor Drive signal AP
B3	GND	-	GND
B4	PUMPR_ENCA	IN	Pump encoder output signal A
B5	SNS5V	OUT	Power supply (+5V)
B6	PUMPR_ENCB	IN	Pump encoder output signal B
B7	SNS3V	OUT	Power supply (+3.3V)
B8	GND	-	GND
B9	/CONTROL_CAM_R	IN	Pump cam sensor output signal
B10	GND	-	GND
B11	/MEDIA_R	IN	Media sensor output signal
B12	SNS5V	OUT	Power supply (+5V)
B13	N.C	-	N.C

T-6-3

<b>J2502</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	INKBENMI_AM	OUT	Valve motor drive signal AM
2	INKBENMI_AP	OUT	Valve motor drive signal AP
3	SNS3V	OUT	Power supply (+3.3V)
4	GND	-	GND
5	/INKBEN_OPEN_R	IN	Valve open/close detection sensor output signal
6	/TANKCOVER_R	IN	Ink tank cover switch output signal
7	GND	-	GND
8	N.C.(SNS3V)	-	N.C.
9	N.C.(GND)	-	N.C.
10	N.C.(/INKBEN_CAM_R)	-	N.C.

T-6-4

<b>J2601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	POWER_ON	IN	Power switch signal
2	GND	-	GND
3	+5V	OUT	Power supply (+5V)
4	BUZZER	OUT	Buzzer control signal
5	PDO	OUT	Panel IC control signal
6	+3.3V	OUT	Power supply (+3.3V)
7	PDI	OUT	Panel IC data signal
8	GND	-	GND
9	/PRESET	OUT	Panel reset signal
10	GND	-	GND
11	PCK	OUT	Panel IC clock signal
12	PANEL5V_ON	OUT	Power supply (+5V)
13	/PCS	OUT	Panel IC chip select signal

T-6-5

<b>J2701</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
A1	/LFENCB	IN	Feed roller encoder output signal B
A2	+5V	OUT	Power supply (+5V)
A3	LF_ENCA	IN	Feed roller encoder output signal A

J2701			
Pin Number	Signal name	IN/OUT	Function
A4	GND	-	GND
A5	SNS3V	OUT	Power supply (+3.3V)
A6	GND	-	GND
A7	/LF_HP	IN	Feed roller HP sensor output signal
A8	N.C.(VM_26V)	-	N.C
A9	N.C	-	N.C
A10	N.C	-	N.C
A11	N.C	-	N.C
B1	VM_26V	OUT	Power supply (+26V)
B2	KYUINFAN_ALARM	IN	Suction fan alarm signal
B3	KYUINFAN_PWM	OUT	Suction fan duty control signal
B4	VMGND	-	GND
B5	VM_26V	OUT	Power supply (+26V)
B6	MISTFAN_R_ALARM	IN	Mist fan (R) alarm signal
B7	VMGND	-	GND
B8	VM_26V	OUT	Power supply (+26V)
B9	MISTFAN_L_ALARM	IN	Mist fan (L) alarm signal
B10	VMGND	-	GND
B11	N.C	-	N.C

T-6-6

J2702			
Pin Number	Signal name	IN/OUT	Function
1	VM 26V	OUT	Power supply (+26V)
2	DCOVER_SOL	OUT	Upper cover lock solenoid (L) drive signal
3	VM 26V	OUT	Power supply (+26V)
4	DCOVER_SOL	OUT	Upper cover lock solenoid (R) drive signal
5	N.C	-	N.C

T-6-7

J2801			
Pin Number	Signal name	IN/OUT	Function
1	LFSP_A	OUT	Feed motor drive signal A
2	LFSP_VM	OUT	Power supply (+32V)
3	LFSP_AB	OUT	Feed motor drive signal AB
4	LFSP_BB	OUT	Feed motor drive signal BB
5	LFSP_VM	OUT	Power supply (+32V)

<b>J2801</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
6	LFSP_B	OUT	Feed motor drive signal B

T-6-8

<b>J3001</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	VM	OUT	Power supply (+32V)
2	-	-	-
3	-	-	-
4	VM_CR	IN	Upper cover lock switch output signal

T-6-9

<b>J3002</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	TH	IN	Thermister output signal
2	GND	-	GND
3	Vout	IN	Humidity sensor output signal
4	+5V	OUT	Power supply (+5V)

T-6-10

<b>J3101</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	CRM_C	OUT	Carriage motor phase drive signal (C)
2	CRM_B	OUT	Carriage motor phase drive signal (B)

T-6-11

<b>J3201</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	TANK_CLK	OUT	Ink tank clock signal
2	GND	-	GND
3	TANK_DAT2	IN/OUT	Ink tank data signal 2
4	TANK_ON(+3.3V)	OUT	Power supply (+3.3V)
5	TANK_DAT1	IN/OUT	Ink tank data signal 1
6	TANK_DAT0	IN/OUT	Ink tank data signal 0

J3201			
Pin Number	Signal name	IN/OUT	Function
7	GND	-	GND
8	INK_DETECT0	IN	Ink detection sensor output signal 0
9	INK_DETECT1	IN	Ink detection sensor output signal 1
10	INK_DETECT2	IN	Ink detection sensor output signal 2
11	N.C	-	N.C

T-6-12

J3202			
Pin Number	Signal name	IN/OUT	Function
1	TANK_CLK	OUT	Ink tank clock signal
2	GND	-	GND
3	TANK_DAT8	IN/OUT	Ink tank data signal 8
4	TANK_ON(+3.3V)	OUT	Power supply (+3.3V)
5	TANK_DAT7	IN/OUT	Ink tank data signal 7
6	TANK_DAT6	IN/OUT	Ink tank data signal 6
7	GND	-	GND
8	INK_DETECT6	IN	Ink detection sensor output signal 6
9	INK_DETECT7	IN	Ink detection sensor output signal 7
10	INK_DETECT8	IN	Ink detection sensor output signal 8
11	N.C	-	N.C
12	N.C	-	N.C

T-6-13

J3301			
Pin Number	Signal name	IN/OUT	Function
1	SDA	IN/OUT	Maintenance cartridge ROM control signal (data)
2	SCL	IN/OUT	Maintenance cartridge ROM control signal (clock)
3	GND	-	GND
4	+3.3V	OUT	Power supply (+3.3V)
5	GND	-	GND
6	/FUTO_CLMP	OUT	Head management sensor clamp signal
7	/FUTO_ON	OUT	Head management sensor ON/OFF signal
8	+5V	OUT	Power supply (+5V)
9	/FUTO_CMP	IN	Head management sensor ink detection signal

T-6-14

<b>J3401</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	VMGND	-	GND
2	VMGND	-	GND
3	VMGND	-	GND
4	VMGND	-	GND
5	VH_MONI1	IN	VH control signal 1
6	VH_ENB	OUT	VH power supply ON/OFF signal
7	VH_MONI2	IN	VH control signal 2
8	GND	-	GND
9	+3.3V	OUT	Power supply (+3.3V)
10	+3.3V	OUT	Power supply (+3.3V)
11	GND	-	GND
12	SNS5V	OUT	Power supply (+5V)
13	SNS5V	OUT	Power supply (+5V)
14	VM	OUT	Power supply (+32V)
15	VM	OUT	Power supply (+32V)
16	VM	OUT	Power supply (+32V)
17	VM	OUT	Power supply (+32V)
18	VM	OUT	Power supply (+32V)
19	VM	OUT	Power supply (+32V)
20	VM	OUT	Power supply (+32V)
21	VM	OUT	Power supply (+32V)
22	VMGND	-	GND
23	VMGND	-	GND
24	VMGND	-	GND
25	VMGND	-	GND

T-6-15

<b>J3601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	/ENCODER_A	IN	Carriage encoder output signal A
2	/ENCODER_B	IN	Carriage encoder output signal B
3	GND	-	GND
4	/CR_COVER	IN	Carriage cover sensor output signal
5	/OUT_ENB	OUT	Head data enable signal
6	H-DASH_LICC2_B	OUT	Head analogue switch A/D trigger signal
7	GND	-	GND
8	H1-D-DATA-7-OD_B	OUT	Odd head data signal 7(D)

<b>J3601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
9	GND	-	GND
10	H1-E-HE-8_B	OUT	Head heat enable signal 8(E)
11	GND	-	GND
12	H1-E-DATA-8-OD_B	OUT	Odd head data signal 8(E)
13	GND	-	GND
14	H1-F-DATA-10-OD_B	OUT	Odd head data signal 10(F)
15	GND	-	GND
16	H1-E-DATA-9-OD_B	OUT	Odd head data signal 9(E)
17	GND	-	GND
18	H1-F-HE-10_B	OUT	Head heat enable signal 10(F)
19	GND	-	GND
20	H1-F-DATA-11-OD_B	OUT	Odd head data signal 11(F)
21	GND	-	GND
22	H1-F-HE-11_B	OUT	Head heat enable signal 11(F)
23	GND	-	GND
24	H1-F-DATA-11-EV_B	OUT	Even head data signal 11(F)
25	GND	-	GND
26	H1-F-DATA-10-EV_B	OUT	Even head data signal 10(F)
27	GND	-	GND
28	H1-E-HE-9_B	OUT	Head heat enable signal 9(E)
29	GND	-	GND
30	H1-E-DATA-9-EV_B	OUT	Even head data signal 9(E)
31	GND	-	GND
32	VH_DIS	OUT	VH selection signal
33	H1-DASLK_LICC2	OUT	Head analogue switch clock signal
34	H1-DLD_LICC2	OUT	Head analogue switch latch signal
35	H1-DATA_LICC2	OUT	Head analogue switch data signal
36	PWLED2_ON	OUT	Multi sensor LED2 drive signal
37	PWLED1_ON	OUT	Multi sensor LED1 drive signal
38	PWLED3_ON	OUT	Multi sensor LED3 drive signal
39	/H3V_ON_B	OUT	Power supply (+3V)
40	MLT_SENS_1IN	IN	Multi sensor signal 1
41	MLT_SENS_2IN	IN	Multi sensor signal 2
42	PWLED4_ON	OUT	Multi sensor LED4 drive signal
43	GND	-	GND
44	H1-B-DATA-2-OD_B	OUT	Odd head data signal 2(B)
45	GND	-	GND
46	H1-B-DATA-3-OD_B	OUT	Odd head data signal 3(B)
47	GND	-	GND
48	H1-C-HE-4_B	OUT	Head heat enable signal 4(C)



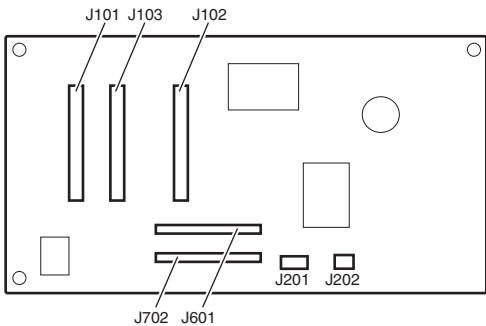
<b>J3601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
49	GND	-	GND
50	H1-C-DATA-4-OD_B	OUT	Odd head data signal 4(C)

T-6-16

<b>J3602</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	IO_ASIC_SDA	IN/OUT	Head ROM control signal (data)
2	IO_ASIC_SCL	IN/OUT	Head ROM control signal (clock)
3	GND	-	GND
4	H1-E-DATA-8-EV_B	OUT	Even head data signal 8(E)
5	GND	-	GND
6	H1-D-HE-7_B	OUT	Head heat enable signal 7(D)
7	GND	-	GND
8	H1-D-DATA-7-EV_B	OUT	Even head data signal 7(D)
9	GND	-	GND
10	H1-D-DATA-6-EV_B	OUT	Even head data signal 6(D)
11	GND	-	GND
12	H1-D-DATA-6-OD_B	OUT	Odd head data signal 6(D)
13	GND	-	GND
14	H1-D-HE-6_B	OUT	Head heat enable signal 6(D)
15	GND	-	GND
16	H1-C-HE-5_B	OUT	Head heat enable signal 5(C)
17	GND	-	GND
18	H1-C-DATA-5-OD_B	OUT	Odd head data signal 5(C)
19	GND	-	GND
20	H1-DSOUT2	IN	Head temperature output signal 2
21	H1-DSOUT1	IN	Head temperature output signal 1
22	GND	-	GND
23	LV_H1_CLKN	OUT	Head clock signal N
24	LV_H1_CLKP	OUT	Head clock signal P
25	GND	-	GND
26	/H1_LT_B	OUT	Head latch signal
27	GND	-	GND
28	H1-C-DATA-5-EV_B	OUT	Even head data signal 5(C)
29	GND	-	GND
30	H1-B-HE-3_B	OUT	Head heat enable signal 3(B)
31	GND	-	GND
32	H1-C-DATA-4-EV_B	OUT	Even head data signal 4(C)

J3602			
Pin Number	Signal name	IN/OUT	Function
33	GND	-	GND
34	H1-B-DATA-3-EV_B	OUT	Even head data signal 3(B)
35	GND	-	GND
36	H1-B-DATA-2-EV_B	OUT	Even head data signal 2(B)
37	GND	-	GND
38	H1-A-DATA-1-EV_B	OUT	Even head data signal 1(A)
39	GND	-	GND
40	H1-A-HE-1_B	OUT	Head heat enable signal 1(A)
41	GND	-	GND
42	H1-A-DATA-0-EV_B	OUT	Even head data signal 0(A)
43	GND	-	GND
44	H1-A-HE-0_B	OUT	Head heat enable signal 0(A)
45	GND	-	GND
46	H1-A-DATA-0-OD_B	OUT	Odd head data signal 0(A)
47	GND	-	GND
48	H1-A-DATA-1-OD_B	OUT	Odd head data signal 1(A)
49	GND	-	GND
50	H1-B-HE-2_B	OUT	Head heat enable signal 2(B)

6.2.2 Carriage relay PCB



F-6-2

T-6-17

J101			
Pin Number	Signal name	IN/OUT	Function
1	VMGND	-	GND
2	VMGND	-	GND

<b>J101</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
3	VMGND	-	GND
4	VMGND	-	GND
5	VM	IN	Power supply (+32V)
6	VM	IN	Power supply (+32V)
7	VM	IN	Power supply (+32V)
8	VM	IN	Power supply (+32V)
9	VM	IN	Power supply (+32V)
10	VM	IN	Power supply (+32V)
11	VM	IN	Power supply (+32V)
12	VM	IN	Power supply (+32V)
13	SNS5V	IN	Power supply (+5V)
14	SNS5V	IN	Power supply (+5V)
15	GND	-	GND
16	+3.3V	IN	Power supply (+3.3V)
17	+3.3V	IN	Power supply (+3.3V)
18	GND	-	GND
19	VH_MONI2	OUT	VH control signal 2
20	VH_ENB	IN	VH Power supply ON/OFF control signal
21	VH_MONI1	OUT	VH control signal 1
22	VMGND	-	GND
23	VMGND	-	GND
24	VMGND	-	GND
25	VMGND	-	GND

T-6-18

<b>J102</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	/ENCODER_A	OUT	Carriage encoder output signal A
2	/ENCODER_B	OUT	Carriage encoder output signal B
3	GND	-	GND
4	/CR_COVER	OUT	Carriage cover sensor output signal
5	/OUT_ENB	IN	Head data enable signal
6	H-DASH_LICC2_B	IN	Head analogue switch A/D trigger signal
7	GND	-	GND
8	H1-D-DATA-7-OD_B	IN	Odd head data signal 7(D)
9	GND	-	GND
10	H1-E-HE-8_B	IN	Head heat enable signal 8(E)
11	GND	-	GND

<b>J102</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
12	H1-E-DATA-8-OD_B	IN	Odd head data signal 8(E)
13	GND	-	GND
14	H1-F-DATA-10-OD_B	IN	Odd head data signal 10(F)
15	GND	-	GND
16	H1-E-DATA-9-OD_B	IN	Odd head data signal 9(E)
17	GND	-	GND
18	/H1-F-HE-10_B	IN	Head heat enable signal 10(F)
19	GND	-	GND
20	H1-F-DATA-11-OD_B	IN	Odd head data signal 11(F)
21	GND	-	GND
22	H1-F-HE-11_B	IN	Head heat enable signal 11(F)
23	GND	-	GND
24	H1-F-DATA-11-EV_B	IN	Even head data signal 11(F)
25	GND	-	GND
26	H1-F-DATA-10-EV_B	IN	Even head data signal 10(F)
27	GND	-	GND
28	H1-E-HE-9_B	IN	Head heat enable signal 9(E)
29	GND	-	GND
30	H1-E-DATA-9-EV_B	IN	Even head data signal 9(E)
31	GND	-	GND
32	VH_DIS	IN	VH selection signal
33	H1-DASLK_LICC2	IN	Head analogue switch clock signal
34	H1-DLD_LICC2	IN	Head analogue switch latch signal
35	H1-DATA_LICC2	IN	Head analogue switch data signal
36	PWLED2_ON	IN	Multi sensor LED2 drive signal
37	PWLED1_ON	IN	Multi sensor LED1 drive signal
38	PWLED3_ON	IN	Multi sensor LED3 drive signal
39	/H3V_ON_B	IN	Power supply (+3V)
40	MLT_SENS_1IN	OUT	Multi sensor signal 1
41	MLT_SENS_2IN	OUT	Multi sensor signal 2
42	PWLED4_ON	IN	Multi sensor LED4 drive signal
43	GND	-	GND
44	H1-B-DATA-2-OD_B	IN	Odd head data signal 2(B)
45	GND	-	GND
46	H1-B-DATA-3-OD_B	IN	Odd head data signal 3(B)
47	GND	-	GND
48	/H1-C-HE-4_B	IN	Head heat enable signal 4(C)
49	GND	-	GND
50	H1-C-DATA-4-OD_B	IN	Odd head data signal 4(C)

T-6-19

<b>J103</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	IO_ASIC_SDA	IN/OUT	Head ROM control signal (data)
2	IO_ASIC_SCL	IN/OUT	Head ROM control signal (clock)
3	GND	-	GND
4	H1-E-DATA-8-EV_B	IN	Even head data signal 8(E)
5	GND	-	GND
6	H1-D-HE-7_B	IN	Head heat enable signal 7(D)
7	GND	-	GND
8	H1-D-DATA-7-EV_B	IN	Even head data signal 7(D)
9	GND	-	GND
10	H1-D-DATA-6-EV_B	IN	Even head data signal 6(D)
11	GND	-	GND
12	H1-D-DATA-6-OD_B	IN	Odd head data signal 6(D)
13	GND	-	GND
14	H1-D-HE-6_B	IN	Head heat enable signal 6(D)
15	GND	-	GND
16	H1-C-HE-5_B	IN	Head heat enable signal 5(C)
17	GND	-	GND
18	H1-C-DATA-5-OD_B	IN	Odd head data signal 5(C)
19	GND	-	GND
20	H1-DSOUT2	OUT	Head temperature output signal 2
21	H1-DSOUT1	OUT	Head temperature output signal 1
22	GND	-	GND
23	LV_H1_CLKN	IN	Head clock signal N
24	LV_H1_CLKP	IN	Head clock signal P
25	GND	-	GND
26	/H1_LT_B	IN	Head latch signal
27	GND	-	GND
28	H1-C-DATA-5-EV_B	IN	Even head data signal 5(C)
29	GND	-	GND
30	H1-B-HE-3_B	IN	Head heat enable signal 3(B)
31	GND	-	GND
32	H1-C-DATA-4-EV_B	IN	Even head data signal 4(C)
33	GND	-	GND
34	H1-B-DATA-3-EV_B	IN	Even head data signal 3(B)
35	GND	-	GND
36	H1-B-DATA-2-EV_B	IN	Even head data signal 2(B)
37	GND	-	GND
38	H1-A-DATA-1-EV_B	IN	Even head data signal 1(A)
39	GND	-	GND

J103			
Pin Number	Signal name	IN/OUT	Function
40	H1-A-HE-1_B	IN	Head heat enable signal 1(A)
41	GND	-	GND
42	H1-A-DATA-0-EV_B	IN	Even head data signal 0(A)
43	GND	-	GND
44	H1-A-HE-0_B	IN	Head heat enable signal 0(A)
45	GND	-	GND
46	H1-A-DATA-0-OD_B	IN	Odd head data signal 0(A)
47	GND	-	GND
48	H1-A-DATA-1-OD_B	IN	Odd head data signal 1(A)
49	GND	-	GND
50	H1-B-HE-2_B	IN	Head heat enable signal 2(B)

T-6-20

J201			
Pin Number	Signal name	IN/OUT	Function
1	/CRENCA	IN	Linear encoder output signal A
2	SNS5V	OUT	Power supply (+5V)
3	/CRENCB	IN	Linear encoder output signal B
4	GND	-	GND

T-6-21

J202			
Pin Number	Signal name	IN/OUT	Function
1	+3.3V	OUT	Power supply (+3.3V)
2	GND	-	GND
3	/CR_COVER	IN	Carriage cover sensor output signal

T-6-22

J601			
Pin Number	Signal name	IN/OUT	Function
1	GND	-	GND
2	GND	-	GND
3	VHT	OUT	Head transistor drive power supply
4	VH_FB	OUT	VH feed back voltage +
5	VH2	OUT	Power supply

<b>J601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
6	VH2	OUT	Power supply
7	VH2	OUT	Power supply
8	VH2	OUT	Power supply
9	VH2	OUT	Power supply
10	VH2	OUT	Power supply
11	VMGND	-	GND
12	VMGND	-	GND
13	VMGND	-	GND
14	VMGND	-	GND
15	VMGND	-	GND
16	VMGND	-	GND
17	VH1	OUT	Power supply
18	VH1	OUT	Power supply
19	VH1	OUT	Power supply
20	VH1	OUT	Power supply
21	VH1	OUT	Power supply
22	VH1	OUT	Power supply
23	VH1_FB	OUT	VH feed back voltage -
24	H3V	OUT	Power supply (+3V)
25	VMGND	-	GND
26	PWLED4	OUT	Multi sensor LED 4 drive signal
27	PWLED3	OUT	Multi sensor LED 3 drive signal
28	PWLED2	OUT	Multi sensor LED 2 drive signal
29	PWLED1	OUT	Multi sensor LED 1 drive signal
30	VMGND	-	GND

T-6-23

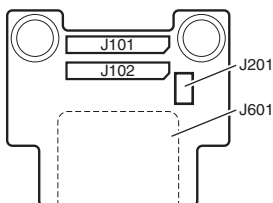
<b>J702</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	MLT_SNS_2IN	IN	Multi sensor signal 2
2	MLT_SNS_1IN	IN	Multi sensor signal 1
3	H1-C-DATA-4-OD	OUT	Odd head data signal 4(C)
4	/H1-C-HE-4	OUT	Head heat enable signal 4(C)
5	H1-B-DATA-3-OD	OUT	Odd head data signal 3(B)
6	H1-B-DATA-2-OD	OUT	Odd head data signal 2(B)
7	/H1-B-HE-2	OUT	Head heat enable signal 2(B)
8	H1-A-DATA-1-OD	OUT	Odd head data signal 1(A)
9	H1-A-DATA-0-OD	OUT	Odd head data signal 0(A)

<b>J702</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
10	/H1-A-HE-0	OUT	Head heat enable signal 0(A)
11	H1-A-DATA-0-EV	OUT	Even head data signal 0(A)
12	H1-A-DATA-1-EV	OUT	Even head data signal 1(A)
13	/H1-A-HE-1	OUT	Head heat enable signal 1(A)
14	H1-B-DATA-2-EV	OUT	Even head data signal 2(B)
15	H1-B-DATA-3-EV	OUT	Even head data signal 3(B)
16	/H1-B-HE-3	OUT	Head heat enable signal 3(B)
17	H1-C-DATA-4-EV	OUT	Even head data signal 4(C)
18	/H1_LT	OUT	Head latch signal
19	H1-C-DATA-5-EV	OUT	Even head data signal 5(C)
20	/H1-C-HE-5	OUT	Head heat enable signal 5(C)
21	H1-C-DATA-5-OD	OUT	Odd head data signal 5(C)
22	H1_CLK	OUT	Head clock signal
23	H1-D-DATA-7-OD	OUT	Odd head data signal 7(D)
24	H1-D-DATA-6-OD	OUT	Odd head data signal 6(D)
25	/H1-D-HE-6	OUT	Head heat enable signal 6(D)
26	H1-D-DATA-6-EV	OUT	Even head data signal 6(D)
27	H1-D-DATA-7-EV	OUT	Even head data signal 7(D)
28	/H1-D-HE-7	OUT	Head heat enable signal 7(D)
29	H1-E-DATA-8-EV	OUT	Even head data signal 8(E)
30	H1-E-DATA-9-EV	OUT	Even head data signal 9(E)
31	/H1-E-HE-9	OUT	Head heat enable signal 9(E)
32	H1-F-DATA-10-EV	OUT	Even head data signal 10(F)
33	H1-F-DATA-11-EV	OUT	Even head data signal 11(F)
34	/H1-F-HE-11	OUT	Head heat enable signal 11(F)
35	H1-F-DATA-11-OD	OUT	Odd head data signal 11(F)
36	H1-F-DATA-10-OD	OUT	Odd head data signal 10(F)
37	/H1-F-HE-10	OUT	Head heat enable signal 10(F)
38	H1-E-DATA-9-OD	OUT	Odd head data signal 9(E)
39	H1-E-DATA-8-OD	OUT	Odd head data signal 8(E)
40	/H1-E-HE-8	OUT	Head heat enable signal 8(E)
41	GND	-	GND
42	H1_DSOUT1	IN	Head temperature output signal 1
43	H1_DSOUT2	IN	Head temperature output signal 2
44	H1-DLD_LICC2	OUT	Head analogue switch latch signal
45	H1-DATA-LICC2	OUT	Head analogue switch data signal
46	H1-DASLK_LICC2	OUT	Head analogue switch clock signal
47	H1-DASH_LICC2	OUT	Head analogue switch A/D trigger signal
48	SNS5V	OUT	Power supply (+5V)
49	IO-ASIC_SDA	IN/OUT	Head ROM control signal (data)



<b>J702</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
50	IO-ASIC_SCL	IN/OUT	Head ROM control signal (clock)

### 6.2.3 Head relay PCB



F-6-3

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<b>J101</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	VMGND	-	GND
2	PWLED1	IN	Multi sensor LED1 drive signal
3	PWLED2	IN	Multi sensor LED2 drive signal
4	PWLED3	IN	Multi sensor LED3 drive signal
5	PWLED4	IN	Multi sensor LED4 drive signal
6	VMGND	-	GND
7	H3V	IN	Power supply (+3V)
8	VH1_FB	IN	VH feed back voltage -
9	VH1	IN	Power supply
10	VH1	IN	Power supply
11	VH1	IN	Power supply
12	VH1	IN	Power supply
13	VH1	IN	Power supply
14	VH1	IN	Power supply
15	VMGND	-	GND
16	VMGND	-	GND
17	VMGND	-	GND
18	VMGND	-	GND
19	VMGND	-	GND
20	VMGND	-	GND
21	VH2	IN	Power supply
22	VH2	IN	Power supply
23	VH2	IN	Power supply

J101			
Pin Number	Signal name	IN/OUT	Function
24	VH2	IN	Power supply
25	VH2	IN	Power supply
26	VH2	IN	Power supply
27	VH_FB	IN	VH feed back voltage +
28	VHT	IN	Head transistor drive power supply
29	GND	-	GND
30	GND	-	GND

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J102			
Pin Number	Signal name	IN/OUT	Function
1	IO-ASIC_SCL	IN/OUT	Head ROM control signal (clock)
2	IO-ASIC_SDA	IN/OUT	Head ROM control signal (data)
3	SNS5V	IN	Power supply (+5V)
4	H1-DASH_LICC2	IN	Head analogue switch A/D trigger signal
5	H1-DASLK_LICC2	IN	Head analogue switch clock signal
6	H1-DATA-LICC2	IN	Head analogue switch data signal
7	H1-DLD_LICC2	IN	Head analogue switch latch signal
8	H1_DSOUT2	OUT	Head temperature output signal 2
9	H1_DSOUT1	OUT	Head temperature output signal 1
10	GND	-	GND
11	/H1-E-HE-8	IN	Head heat enable signal 8(E)
12	H1-E-DATA-8-OD	IN	Odd head data signal 8(E)
13	H1-E-DATA-9-OD	IN	Odd head data signal 9(E)
14	/H1-F-HE-10	IN	Head heat enable signal 10(F)
15	H1-F-DATA-10-OD	IN	Odd head data signal 10(F)
16	H1-F-DATA-11-OD	IN	Odd head data signal 11(F)
17	/H1-F-HE-11	IN	Head heat enable signal 11(F)
18	H1-F-DATA-11-EV	IN	Even head data signal 11(F)
19	H1-F-DATA-10-EV	IN	Even head data signal 10(F)
20	/H1-E-HE-9	IN	Head heat enable signal 9(E)
21	H1-E-DATA-9-EV	IN	Even head data signal 9(E)
22	H1-E-DATA-8-EV	IN	Even head data signal 8(E)
23	/H1-D-HE-7	IN	Head heat enable signal 7(D)
24	H1-D-DATA-7-EV	IN	Even head data signal 7(D)
25	H1-D-DATA-6-EV	IN	Even head data signal 6(D)
26	/H1-D-HE-6	IN	Head heat enable signal 6(D)
27	H1-D-DATA-6-OD	IN	Odd head data signal 6(D)

<b>J102</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
28	H1-D-DATA-7-OD	IN	Odd head data signal 7(D)
29	H1_CLK	IN	Head clock signal
30	H1-C-DATA-5-OD	IN	Odd head data signal 5(C)
31	/H1-C-HE-5	IN	Head heat enable signal 5(C)
32	H1-C-DATA-5-EV	IN	Even head data signal 5(C)
33	/H1_LT	IN	Head latch signal
34	H1-C-DATA-4-EV	IN	Even head data signal 4(C)
35	/H1-B-HE-3	IN	Head heat enable signal 3(B)
36	H1-B-DATA-3-EV	IN	Even head data signal 3(B)
37	H1-B-DATA-2-EV	IN	Even head data signal 2(B)
38	/H1-A-HE-1	IN	Head heat enable signal 1(A)
39	H1-A-DATA-1-EV	IN	Even head data signal 1(A)
40	H1-A-DATA-0-EV	IN	Even head data signal 0(A)
41	/H1-A-HE-0	IN	Head heat enable signal 0(A)
42	H1-A-DATA-0-OD	IN	Odd head data signal 0(A)
43	H1-A-DATA-1-OD	IN	Odd head data signal 1(A)
44	/H1-B-HE-2	IN	Head heat enable signal 2(B)
45	H1-B-DATA-2-OD	IN	Odd head data signal 2(B)
46	H1-B-DATA-3-OD	IN	Odd head data signal 3(B)
47	/H1-C-HE-4	IN	Head heat enable signal 4(C)
48	H1-C-DATA-4-OD	IN	Odd head data signal 4(C)
49	MLT_SNS_1IN	OUT	Multi sensor signal 1
50	MLT_SNS_2IN	OUT	Multi sensor signal 2

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<b>J201</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	PWLED1	OUT	Multi sensor LED1 drive signal
2	PWLED2	OUT	Multi sensor LED2 drive signal
3	PWLED3	OUT	Multi sensor LED3 drive signal
4	PWLED4	OUT	Multi sensor LED4 drive signal
5	GND	-	GND
6	MLT_SNS_1	IN	Multi sensor signal 1
7	+5V	OUT	Power supply (+5V)
8	MLT_SNS_2	IN	Multi sensor signal 2

<b>J601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
1	VH2	OUT	Power supply
2	VH2	OUT	Power supply
3	VH2	OUT	Power supply
4	VHT12	OUT	Head transistor drive power supply
5	H1-F-DATA-10-EV	OUT	Even head data signal 10(F)
6	IO_ASIC_SDA	IN/OUT	Head ROM control signal (data)
7	IO_ASIC_SCL	IN/OUT	Head ROM control signal (clock)
8	H3V_1	OUT	Power supply (+3V)
9	H1-C-DIA1	IN	Head DI sensor signal 1(C)
10	/H1-A-HE-1	OUT	Head heat enable signal 1(A)
11	VH1	OUT	Power supply
12	VH1	OUT	Power supply
13	VH1	OUT	Power supply
14	VH2	OUT	Power supply
15	VH2	OUT	Power supply
16	H1-E-DATA-9-OD	OUT	Odd head data signal 9(E)
17	/H1-F-HE-11	OUT	Head heat enable signal 11(F)
18	H1-E-DIA1	IN	Head DI sensor signal 1(E)
19	H1-D-DIA1	IN	Head DI sensor signal 1(D)
20	H3V_1	OUT	Power supply (+3V)
21	H3V_1	OUT	Power supply (+3V)
22	H1-B-DATA-3-EV	OUT	Even head data signal 3(B)
23	H1-A-DATA-0-EV	OUT	Even head data signal 0(A)
24	/H1-B-HE-2	OUT	Head heat enable signal 2(B)
25	VH1	OUT	Power supply
26	VH1	OUT	Power supply
27	H1-D-DIA2	IN	Head DI sensor signal 2(D)
28	/H1-E-HE-8	OUT	Head heat enable signal 8(E)
29	H1-E-DIA2	IN	Head DI sensor signal 2(E)
30	H1-F-DIA2	IN	Head DI sensor signal 2(F)
31	/H1-E-HE-9	OUT	Head heat enable signal 9(E)
32	H1-D-DATA-7-EV	OUT	Even head data signal 7(D)
33	H1-D-HE-6	OUT	Head heat enable signal 6(D)
34	H1-C-DATA-5-OD	OUT	Odd head data signal 5(C)
35	H1-C-DATA-4-EV	OUT	Even head data signal 4(C)
36	H1-A-DATA-1-EV	OUT	Even head data signal 1(A)
37	H1-A-DIA2	IN	Head DI sensor signal 2(A)
38	H1-B-DIA2	IN	Head DI sensor signal 2(B)
39	/H1-C-HE-4	OUT	Head heat enable signal 4(C)

<b>J601</b>			
<b>Pin Number</b>	<b>Signal name</b>	<b>IN/OUT</b>	<b>Function</b>
40	H1-D-DATA-7-OD	OUT	Odd head data signal 7(D)
41	H1-E-DATA-8-OD	OUT	Odd head data signal 8(E)
42	/H1-F-HE-10	OUT	Head heat enable signal 10(F)
43	H1-F-DATA-11-EV	OUT	Even head data signal 11(F)
44	H1-E-DATA-8-EV	OUT	Even head data signal 8(E)
45	H1-D-DATA-6-EV	OUT	Even head data signal 6(D)
46	H1-C-DIA2	IN	Head DI sensor signal 2(C)
47	H1-C-DATA-5-EV	OUT	Even head data signal 5(C)
48	H1-B-DIA1	IN	Head DI sensor signal 1(B)
49	/H1-A-HE-0	OUT	Head heat enable signal 0(A)
50	H1-B-DATA-2-OD	OUT	Odd head data signal 2(B)
51	H1-B-DATA-3-OD	OUT	Odd head data signal 3(B)
52	H1-C-DATA-4-OD	OUT	Odd head data signal 4(C)
53	GND	-	GND
54	GND	-	GND
55	GND	-	GND
56	H1-F-DATA-11-OD	OUT	Odd head data signal 11(F)
57	H1-E-DATA-9-EV	OUT	Even head data signal 9(E)
58	GND	-	GND
59	H1-D-DATA-6-OD	OUT	Odd head data signal 6(D)
60	/H1-C-HE-5	OUT	Head heat enable signal 5(C)
61	/H1-B-HE-3	OUT	Head heat enable signal 3(B)
62	H1-A-DIA1	IN	Head DI sensor signal 1(A)
63	H1-A-DATA-1-OD	OUT	Odd head data signal 1(A)
64	GND	-	GND
65	GND	-	GND
66	GND	-	GND
67	GND	-	GND
68	H1-F-DATA-10-OD	OUT	Odd head data signal 10(F)
69	H1-F-DIA1	IN	Head DI sensor signal 1(F)
70	/H1-D-HE-7	OUT	Head heat enable signal 7(D)
71	GND	-	GND
72	H1_CLK	OUT	Head clock signal
73	/H1_LT	OUT	Head latch signal
74	H1-B-DATA-2-EV	OUT	Even head data signal 2(B)
75	H1-A-DATA-0-OD	OUT	Odd head data signal 0(A)
76	GND	-	GND
77	GND	-	GND
78	GND	-	GND

## 6.3 Version Up

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### 6.3.1 Firmware Update Tool

Use of the following tools allows you to update the firmware of the system controller incorporated in the printer.

- GARO Firmware Update Tool
- L Printer Service Tool

#### 1. GARO Firmware Update Tool

GARO Firmware Update Tool is the same as that for user.

Procedure

- 1) Start CARO Firmware Update Tool.
- 2) Place the printer in the online mode.
- 3) Transfer the firmware data to the printer according to the instructions shown on the display.
- 4) The data shown on the LCD on the operation panel changes and the firmware is updated automatically.
- 5) When firmware update is completed, the printer will start again.

File transfer route:

USB, IEEE1394, network

#### 2. L Printer Service Tool

Procedure

- 1) Start L Printer Service Tool.
- 2) Place the printer in the online mode.
- 3) Specify the firmware file(jdl) and then transfer it.
- 4) The data shown on the LCD on the operation panel changes and the firmware is updated automatically.
- 5) When firmware update is completed, the printer will start again.

File transfer route:

USB, IEEE1394, network (directly connected using a cross cable)

## 6.4 Service Tools

### 6.4.1 List of Tools

T-6-28

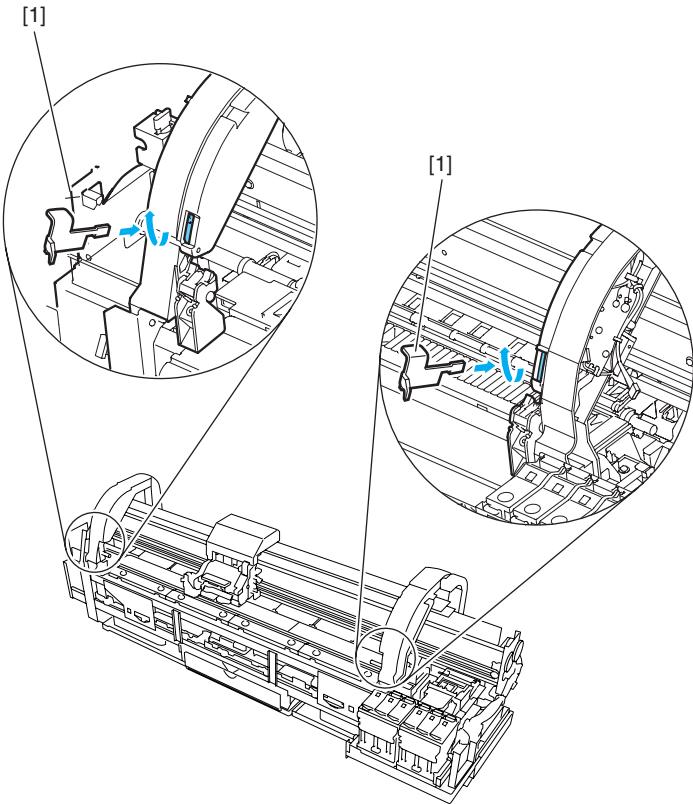
General-purpose tools	Application
Long phillips screwdriver	Inserting and removing screw
Phillips screwdriver	Inserting and removing screw
Flat-head screwdriver	Removing the E-ring
Needle-nose pliers	Inserting and removing the spring parts
Hex key wrench	Inserting and removing hexagonal screws
Flat brush	Applying grease
Lint free paper	Wiping off ink
Rubber gloves	Preventing ink stains

T-6-29

Special-purpose tools	Application
Grease MOLYKOTE PG-641 (CK-0562-000)	Applying to specified locations
Grease PERMALUBE G-2 (CK-0551-020)	Applying to specified locations
Cover switch tool (QY9-0103-000)	Pressing the cover switch

6.4.2 Using the Cover Switch Tool

Use the cover switch tool[1] by inserting the hook into the cover switch.





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## Chapter 7

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### **SERVICE MODE**

# Contents

7.1 Service Mode ..... 7-1

    7.1.1 Service Mode ..... 7-1

    7.1.2 Service Mode Map ..... 7-2

    7.1.3 Details of Service Mode ..... 7-6

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## 7.1 Service Mode

---

### 7.1.1 Service Mode

#### a. How to enter the Service mode

Enter the Service mode following the procedure below.

- (1) Turn off the printer.
- (2) Turn on the printer while holding down the [Paper Source]key and [Information]key.  
\*Keep pressing the above buttons until "Initializing"appears on the display.
- (3) "S" is displayed in the upper right corner of the display showing the version.
- (4) After display of "Online",pressing the [Menu]key displays the SERVICE MODE top menu and the MESSAGE LED flashes.

\*The Service mode is added to the options in the Main menu. The Service mode can be entered even in the error status(when an error message is shown on the display)by turning the power off and then using the above key operation.

#### b. How to exit the Service mode

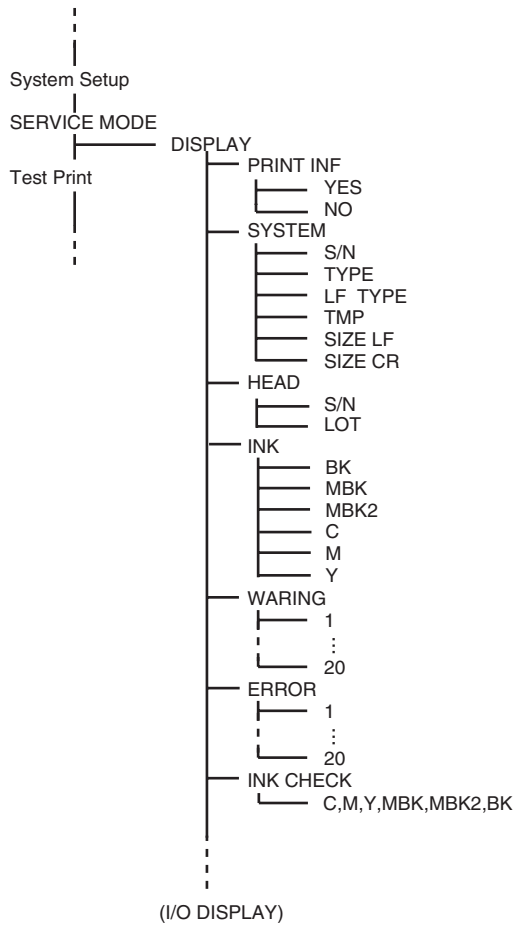
Turn off the printer.

#### c. Key operation in the service mode

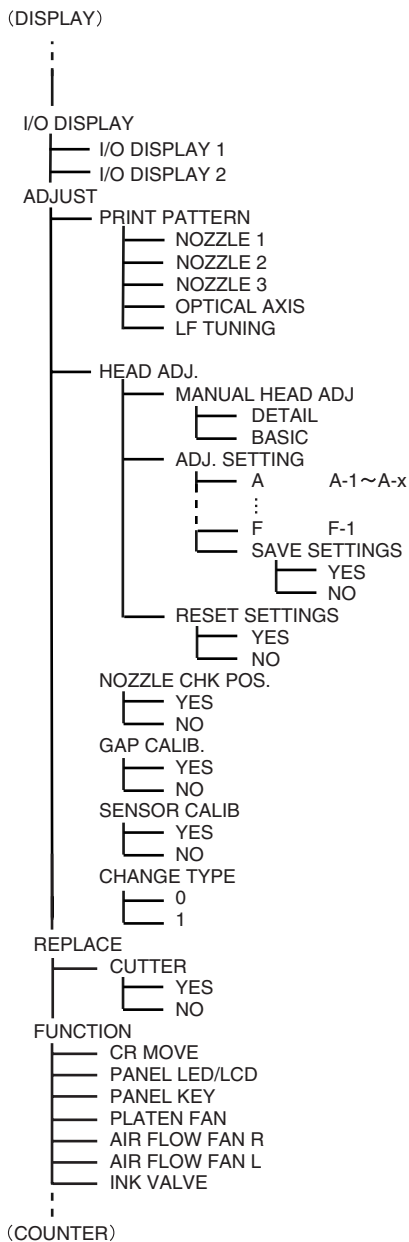
- Selecting menus and parameters:[◀] or [▶] key
- Going to the next lower-level menu:[▼] key
- Going to the next higher-level menu:[▲] key
- Determining a selected menu or parameter:[OK] key

### 7.1.2 Service Mode Map

The hierarchy of menus and parameters in the Service mode is shown below.



F-7-1



F-7-2

(FUNCTION)

COUNTER

PRINTER

- LIFE TTL
- LIFE ROLL
- LIFE CUTSHEET
- LIFE CASSETTE
- LIFE A
- ⋮ (LIFE B,C,D,E)
- LIFE F
- POWER ON
- W-INK
- CUTTER
- WIPE

CARRIGE

- PRINT
- CR COUNT
- CR DIST
- PRINT COUNT

PURGE

- CLN-A-1
- ⋮ (CLN-A-2,3,6,10,11,15,16,17)
- CLN-A-TTL
- CLN-M-1
- ⋮ (CLN-M-4,5,6)
- CLN-M-TTL

CLEAR

- CLR-INK CONSUME
- CLR-CUTTER EXC.
- CLR-MTC EXC.
- CLR-HEAD EXC.
- CLR-UNIT A EXC.
- ⋮ (CLR-UNIT B,D,F,H,L,P,Q,R,)
- CLR-UNIT V EXC.
- CLR-FACTORY CNT.

EXCHANGE

- CUTTER EXC.
- MTC EXC.
- HEAD R EXC.
- HEAD L EXC.
- BOARD EXC.
- UNIT A EXC.
- ⋮ (UNIT B,D,F,H,L,P,Q,R,)
- UNIT V EXC.

DETAIL-CNT

- MOVE PRINTER
- N-INK CHK (BK)
- N-INK CHK (MBK)
- N-INK CHK (MBK2)
- N-INK CHK (C)
- N-INK CHK (M)
- N-INK CHK (Y)
- MEDIACONFIG-CNT

INK-USE1

- INK-USE1(BK)
- INK-USE1(MBK)
- INK-USE1(MBK2)
- INK-USE1(C)
- INK-USE1(M)
- INK-USE1(Y)
- INK-USE1(TTL)
- N-INK-USE1(BK)
- N-INK-USE1(MBK)
- N-INK-USE1(MBK2)
- N-INK-USE1(C)
- N-INK-USE1(M)
- N-INK-USE1(Y)
- N-INK-USE1(TTL)

INK-USE2

- INK-USE2(BK)
- INK-USE2(MBK)
- INK-USE2(MBK2)
- INK-USE2(C)
- INK-USE2(M)
- INK-USE2(Y)
- INK-USE2(TTL)
- N-INK-USE2(BK)
- N-INK-USE2(MBK)
- N-INK-USE2(MBK2)
- N-INK-USE2(C)
- N-INK-USE2(M)
- N-INK-USE2(Y)
- N-INK-USE2(TTL)

INK-EXC

- INK-EXC(BK)
- INK-EXC(MBK)
- INK-EXC(MBK2)
- INK-EXC(C)
- INK-EXC(M)
- INK-EXC(Y)
- INK-EXC(TTL)
- N-INK-EXC(BK)
- N-INK-EXC(MBK)
- N-INK-EXC(MBK2)
- N-INK-EXC(C)
- N-INK-EXC(M)
- N-INK-EXC(Y)
- N-INK-EXC(TTL)

(COUNTER)

(COUNTER)

```

├── MEDIA1
│   ├── NAME
│   ├── TTL <m2>
│   ├── TTL <sq,f>
│   ├── ROLL <m2>
│   ├── ROLL <sq,f>
│   ├── CUTSHEET <m2>
│   ├── CUTSHEET <sq,f>
│   ├── CASSETTE <m2>
│   └── CASSETTE <sq,f>
├── (MEDIA 2~6)
├── MEDIA7
│   ├── NAME
│   ├── TTL <m2>
│   ├── TTL <sq,f>
│   ├── ROLL <m2>
│   ├── ROLL <sq,f>
│   ├── CUTSHEET <m2>
│   ├── CUTSHEET <sq,f>
│   ├── CASSETTE <m2>
│   └── CASSETTE <sq,f>
├── MEDIA OTHER
│   ├── NAME
│   ├── TTL <m2>
│   ├── TTL <sq,f>
│   ├── ROLL <m2>
│   ├── ROLL <sq,f>
│   ├── CUTSHEET <m2>
│   ├── CUTSHEET <sq,f>
│   ├── CASSETTE <m2>
│   └── CASSETTE <sq,f>
├── MEDIASIZE1 ROLL
│   ├── P-SQ 24-36
│   ├── P-SQ 17-24
│   ├── P-SQ -17
│   ├── P-CNT 24-36
│   ├── P-CNT 17-24
│   └── P-CNT -17
├── MEDIASIZE2 ROLL
│   ├── D-SQ 24-36
│   ├── D-SQ 17-24
│   ├── D-SQ -17
│   ├── D-CNT 24-36
│   ├── D-CNT 17-24
│   └── D-CNT -17
├── MEDIASIZE1 CUT
│   ├── P-SQ 24-36
│   ├── P-SQ 17-24
│   ├── P-SQ -17
│   ├── P-CNT 24-36
│   ├── P-CNT 17-24
│   └── P-CNT -17
└── MEDIASIZE2 CUT
    ├── D-SQ 24-36
    ├── D-SQ 17-24
    ├── D-SQ -17
    ├── D-CNT 24-36
    ├── D-CNT 17-24
    └── D-CNT -17

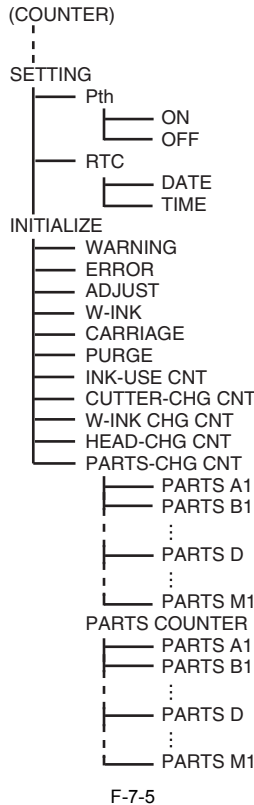
```

(SETTING)

```

├── HEAD DOT. CNT 1
│   ├── BK
│   ├── MBK
│   ├── MBK2
│   ├── C
│   ├── M
│   ├── Y
│   └── TTL
├── HEAD DOT. CNT 2
│   ├── BK
│   ├── MBK
│   ├── MBK2
│   ├── C
│   ├── M
│   ├── Y
│   └── TTL
└── PARTS CNT.
    ├── COUNTER A
    │   └── PARTS A1
    │       └── ...
    │       └── PARTS A7
    ├── COUNTER D
    │   └── PARTS D1
    │       └── ...
    │       └── PARTS D4
    ├── COUNTER F
    │   └── PARTS F1
    ├── COUNTER H
    │   └── PARTS H1
    ├── COUNTER K
    │   └── PARTS K1
    ├── COUNTER L
    │   └── PARTS L1
    ├── COUNTER M
    │   └── PARTS M1
    ├── COUNTER P
    │   └── PARTS P1
    ├── COUNTER Q
    │   └── PARTS Q1
    ├── COUNTER R
    │   └── PARTS R1
    ├── COUNTER V
    │   └── PARTS V1

```



7.1.3 Details of Service Mode

This section provides details of the Service mode menus.

a. **DISPLAY**

Displays and prints the printer information.

(1) **PRINF INF**

Prints adjustment values in the User menu an all of **DISPLAY** and **COUNTER** parameters on A4-size or lager paper.

When a roll media is used,the layout is optimized according to the media width in order to save paper.

(2) **SYSTEM**

Displays the printer information shown below.

T-7-1

Display	Description	Unit
S/N	Serial number of printer	-
TYPE	Type setting on main controller PCB	-
LF TYPE	Feed roller type	0 or 1



Display	Description	Unit
TMP	Ambient temperature	C
SIZE LF	Detected size of loaded media (feed direction) 0 is always detected for the roll media.	mm/inch
SIZE CR	Detected size of loaded media (carriage direction)	mm/inch

## (3) HEAD

Displays the following EEPROM information in the printhead.

T-7-2

Display	Description
S/N	Serial number of printhead
LOT	Lot number of printhead

## (4) INK

Displays the numbers of days passed since installation of the following ink tanks.

If any ink tank that does not allow the printer to count the number of days passed is installed, an error message is displayed.

T-7-3

Display	Description	Unit
BK	Number of days passed since the BK ink tank was installed	Day(s)
MBK	Number of days passed since the MBK ink tank was installed	Day(s)
MBK 2	Number of days passed since the MBK2 ink tank was installed	Day(s)
C	Number of days passed since the C ink tank was installed	Day(s)
M	Number of days passed since the M ink tank was installed	Day(s)
Y	Number of days passed since the Y ink tank was installed	Day(s)

## (5) WARNING

Displays the warning history (up to 20 events). The newest event has the smallest history number.

## (6) ERROR

Displays the error history (up to 20 events). The newest event has the smallest history number.

## (7) INK CHECK

Displays the history of execution of "Ink Check Off" in the Main menu in the order of C, M, Y, MBK, MBK, and BK from in this order.

0: No execution

1: Executed at least once

**b. I/O DISPLAY**(\*To be supported by the next version)

Shows the statuses and sensors and switches on the display.

ON=1

OFF=0

Screen 1

T-7-4

I	/	O		D	I	S	P	L	A	Y		1					Upper row
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Lower row

1    2    3    4    5    6    7    8    9    10   11   12   13   14   15   16   Display position

Screen 2

T-7-5

I	/	O		D	I	S	P	L	A	Y		2					Upper row
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Lower row

17   18   19   20   21   22   23   24   25   26   27   28   29   30   31   32   (Display position)

To switch between screens 1 and 2,use the ◀ and ▶ key.  
The relationship between display positions and sensor statuses is summarized in the following table.

T-7-6

Display position	Sensor name	LCD display contents
1	Pump Cam Sensor	0:Sensor ON ,1:Sensor OFF
2	Valve Open/Closed Detection Sensor	0:Sensor ON ,1:Sensor OFF
3	(Not Used)	-
4	(Not Used)	-
5	Spur Cam Sensor	0:Sensor ON ,1:Sensor OFF
6	Lift Cam Sensor	0:Sensor ON ,1:Sensor OFF
7	Feed Roller Hp Sensor	0:Sensor ON ,1:Sensor OFF
8	Top Cover Sensor	0:Cover open ,1:Cover close
9	(Not Used)	-
10	Ink Tank Cover Switch	0:Cover open ,1:Cover close
11	(Not Used)	-
12	Paper Detection Sensor	0:Sensor ON ,1:Sensor OFF
13	(Not Used)	-
14	(Not Used)	-
15	(Not Used)	-

Display position	Sensor name	LCD display contents
16	(Not Used)	-
17	Roll Media Sensor	0:Sensor ON ,1:Sensor OFF
18	Roll Cam Sensor	0:Sensor ON ,1:Sensor OFF
19	(Not Used)	-
20	(Not Used)	-
21	(Not Used)	-
22	(Not Used)	-
23	(Not Used)	-
24	(Not Used)	-
25	(Not Used)	-
26	Roll unit detection	0:Roll unit not detected, 1:Roll unit detected
27	Cutter unit detection	0:Cutter unit no detected, 1:Cutter unit detected
28	(Not Used)	-
29	(Not Used)	-
30	(Not Used)	-
31	(Not Used)	-
32	(Not Used)	-

### c. ADJUST

Performs adjustments and prints the adjustment and check patterns necessary for adjusting the printer parts.

-PRINT PATTERN > NOZZLE 1

1. This nozzle check pattern is used during servicing and is printed in the single direction using a single path. It is used to check for nozzles that are not injecting ink properly.

This pattern is printed on A4-size media in the landscape orientation.

The media type is optional.

-PRINT PATTERN > OPTICAL AXIS

This pattern is used to adjust the registration sensor optical axis. For details, refer to "Disassembly/Adjustment" > "Adjustment and Setup" > "Action to Take after Replacing the Carriage Unit or Multi Sensor".

Use photo glossy paper.

-PRINT PATTERN > LF TUNING

This pattern is used to adjust the cassette feed roller eccentricity. For details, refer to "Disassembly/Adjustment" > "Adjustment and Setup" > "Action to Take after Replacing the Cassette Feed Roller HP Sensor or Cassette Feed Roller Encoder".

Use photo glossy paper.

-HEAD ADJ.

This mode allows you to set or reset the registration adjustment values of individual heads.

### T-7-7

Display	Description
MANUAL HEAD ADJ	Prints the manual head adjustment pattern. DETAIL:Fine adjustment BASIC:Simple adjustment
ADJ. SETTING	Allows you to enter any registration adjustment value within the range of-127-to+127.
RESET SETTING	Resets the registration adjustment values. Adjustment values A1 to F* are reset(to zeros).

- NOZZIE CHK POS.  
This mode allows you to adjust the optical axis of the head management sensor. For details, refer to "Disassembly/Adjustment" > "Adjustment and Setup" > "Action to Take after Replacing the Head Management Sensor".
- GAP CLIB.  
This mode measures the gap between the head and media using a multi sensor and updates the calibration value.
- SENSOR CALIB.  
This mode adjusts the sensor for color calibration. Use a dedicated test chart.
- CHANGE LF TYPE  
This mode allows you to change the LF roller type.  
0:Old roller  
1:New roller

**d. REPLACE**  
Used when replacing the cutter unit. For details, refer to "Disassembly/Adjustment" > "Adjustment and Setup" > "Precautions for Disassembly/Adjustment" > "Cutter".

**e. FUNCTION**  
Checks the operation of the buttons on the operation panel and printer parts.

T-7-8

Display	Description
PANEL LED/LCD	This checks the LEDs and LCD on the operation panel. The LEDs flash, and the squares in the LCD are displayed in a checkerboard pattern and flash alternately. This mode is automatically canceled after completion of the operation.
PANEL KEY	▲ This checks the buttons on the operation panel. The name and symbol of the pressed button is displayed. Pressing the [ ] key allows you to exit this mode. Also, pressing the [Power] button turns off the printer.
PLATEN FAN	This checks the operation of the suction fan. The suction fan rotates for 5 seconds at the maximum speed, and then rotates for 5 seconds at the minimum speed.
AIR FLOW FAN R	This checks the operation of the mist fan R. The mist fan R rotates for 10 seconds.
AIR FLOW FAN L	This checks the operation of the mist fan L. The mist fan L rotates for 10 seconds.
INK VALVE	This checks the operation of the ink valve. The valve motor is driven, and the ink supply valve open/close cam by one turn.

**f. COUNTER**

Displays the service life(number of operation times and time) of each unit and print counts for each media type. The count values discussed here can be printed using the "PRINT INF" option.

-PRINTER:Counters related to product life

T-7-9

Display	Description	Unit
LIFE TTL	Cumulative number of printed media(Equivalent of A4)	Sheets
LIFE ROLL	Cumulative number of printed roll media(equivalent of A4)(printing to PRINT INF only)	Sheets
LIFE CUTSHEET	Cumulative number of printed cut sheets(equivalent to A4)(printing to ORINT INF only)	Sheets
LIFE CASSETTE	Cumulative number of printed cassette sheets(equivalent to A4)(printing to ORINT INF only)	Sheets
LIFE A-F	Cumulative number of printed media for environments A to F	Sheets
POWER ON	Cumulative power-on time(excluding the sleep time)	Hours
W-INK	Maintenance cartridge tank full detection counter	%
CUTTER	Number of cutting operations	Times
WIPE	Number of wiping operations	Times

-CARRIAGE:Counters related to carriage unit

T-7-10

Display	Description	Unit
PRINT	Cumulative printing time	Hours
CR COUNT	Cumulative carriage scan count(one back-and-forth motion=1)	Times
CR DIST.	Cumulative carriage scan distance(210 mm/scan)	Times
PRINTCOUNT	Cumulative print end count	Times

-PURGE:Counters related to purge unit

T-7-11

Display	Description	Unit
CLN-A-1	Cumulative number of automatic cleaning 1 (normal suction) operations	Times
CLN-A-2	Cumulative number of automatic cleaning 2 (ink level adjusting) operations	Times

Display	Description	Unit
CLN-A-3	Cumulative number of automatic cleaning 3 (initial filling) operations	Times
CLN-A-6	Cumulative number of automatic cleaning 6 (strong normal suction) operations	Times
CLN-A-10	Cumulative number of automatic cleaning 10 (ink filling after secondary transportation) operations	Times
CLN-A-11	Cumulative number of automatic cleaning 11 (ink filling after head replacement) operations	Times
CLN-A-15	Cumulative number of automatic cleaning 15 (dot count small suction) operations	Times
CLN-A-16	Cumulative number of automatic cleaning 16 (sedimented ink agitation) operations	Times
CLN-A-17	Cumulative number of automatic cleaning 17 (small suction) operations	Times
CLN-A-TTL	Total number of automatic cleaning operations	Times
CLN-M-1	Cumulative number of manual cleaning 1 (normal suction) operations	Times
CLN-M-4	Cumulative number of manual cleaning 4 (ink draining from head after head replacement) operations	Times
CLN-M-5	Cumulative number of manual cleaning 5 (ink draining from head and tube before transportation ) operations	Times
CLN-M-6	Cumulative number of manual cleaning 6 (normal strong suction) operations	Times
CLN-M-TTL	Total number of manual cleaning operations	Times

-CLEAR:Counters related to counter initialization

T-7-12

Display	Description	Unit
CLR-INK CONSUME	Cumulative count of ink section consumption amount clearing	Times
CLR-CUTTER EXC.	Cumulative count of cutter replacement count clearing	Times
CLR-MTC EXC.	Cumulative count of maintenance cartridge replacement count clearing	Times
CLR-HEAD EXC.	Cumulative count of print head replacement count clearing	Times
CLR-UNIT A EXC.	Cumulative count of unit A(waste ink system) replacement count clearing	Times
CLR-UNIT B EXC.	Cumulative count of unit B(platen duct) replacement count clearing	Times
CLR-UNIT D EXC.	Cumulative count of unit D(carriage unit) replacement count clearing	Times
CLR-UNIT F EXC.	Cumulative count of unit F(ink supply system) replacement count clearing	Times

Display	Description	Unit
CLR-UNIT H EXC.	Cumulative count of unit H(purge) replacement count clearing	Times
CLR-UNIT L EXC.	Cumulative count of unit L(head management sensor) replacement count clearing	Times
CLR-UNIT P EXC.	Cumulative count of unit P(feed motor) replacement count clearing	Times
CLR-UNIT Q EXC.	Cumulative count of unit Q(feed roller) replacement count clearing	Times
CLR-UNIT R EXC.	Cumulative count of unit R(spur cam) replacement count clearing	Times
CLR-UNIT V EXC.	Cumulative count of unit V(mist fan unit) replacement count clearing	Times
CLR-FACTORY CNT.	For factory	Times

- EXCHANGE: Counters related to parts replacement

T-7-13

Display	Description	Unit
CUTTER EXC.	Cutter replacement count	Times
MTC EXC.	Maintenance cartridge replacement count	Times
HEAD EXC.	Print head replacement count	Times
BOARD EXC.(M/B)	Main controller PCB replacement count	Times
UNIT A EXC.	Unit A(waste ink system) replacement count	Times
UNIT B EXC.	Unit B(platen duct) replacement count	Times
UNIT D EXC.	Unit D(carriage unit) replacement count	Times
UNIT F EXC.	Unit F(ink supply system) replacement count	Times
UNIT H EXC.	Unit H(purge) replacement count	Times
UNIT L EXC.	Unit L(head management sensor) replacement count	Times
UNIT P EXC.	Unit P(feed motor) replacement count	Times
UNIT Q EXC.	Unit Q(feed roller) replacement count	Times
UNIT R EXC.	Unit R(spur cam) replacement count	Times
UNIT V EXC.	Unit V(mist fan unit) replacement count	Times

- DETAIL-CNT: Counters related to ink

T-7-14

Display	Description	Unit
MOVE PRINTER	Number of "Move Printer" operations	Times

Display	Description	Unit
N- INKCHECK( XX)	XX: Ink color Number of "Stop Ink Check" operations	Times
MEDIACON FIG-CNT	Number of times media was registered by media editor	Times

- INK-USE1: Counters related to ink

T-7-15

Display	Description	Unit
INK USE1(XX)	XX: Ink color Cumulative consumption amount of each color of generic ink	ml
INK USE1(TTL)	Total consumption amount of generic ink	ml
N-INK USE1(XX)	XX: Ink color Cumulative consumption amount of each color of refill ink	ml
N-INK USE1(TTL)	Total consumption amount of each color of refill ink	ml

- INK-USE2: Counters related to ink

T-7-16

Display	Description	Unit
INK USE2(XX)	XX: Ink color Cumulative consumption amount of each color of generic ink	ml
INK USE2(TTL)	Total consumption amount of generic ink	ml
N-INK USE2(XX)	XX: Ink color Cumulative consumption amount of each color of refill ink	ml
N-INK USE2(TTL)	Total consumption amount of each color of refill ink	ml

- INK-EXC: Counters related to ink

T-7-17

Display	Description	Unit
INK USE EXC(XX)	XX: Ink color Cumulative count of generic ink replacement	ml
INK USE EXC(TTL)	Total count of generic replacement of each color of ink	ml



Display	Description	Unit
N-INK USE EXC(XX)	XX: Ink color Cumulative count of refill ink replacement	ml
N-INK USE EXC(TTL)	Total count of replacement of each color of ink	ml

- MEDIA x (x: 1 to 7): Counters related to media

Cumulative print areas are displayed for media 1-7 beginning with the media with the maximum cumulative print area.

T-7-18

Display	Description	Unit
NAME	Media type	-
TTL	Cumulative print area of all media feed trays (metric)	m2
TTL	Cumulative print area of all media feed trays (inch)	Sq.f
ROLL	Cumulative print area of roll media (metric)	m2
ROLL	Cumulative print area of roll media (inch)	Sq.f
CUT SHEET	Cumulative print area of cut sheet (metric)	m2
CUT SHEET	Cumulative print area of cut sheet (inch)	Sq.f

- MEDIA OTHER: Counters related to media

Cumulative print areas are displayed beginning with the media with the eighth-large cumulative print area.

T-7-19

Display	Description	Unit
NAME	Media type	-
TTL	Cumulative print area of all media feed trays (metric)	m2
TTL	Cumulative print area of all media feed trays (inch)	Sq.f
ROLL	Cumulative print area of roll media (metric)	m2
ROLL	Cumulative print area of roll media (inch)	Sq.f
CUT SHEET	Cumulative print area of cut sheet (metric)	m2
CUT SHEET	Cumulative print area of cut sheet (inch)	Sq.f

- MEDIASIZE1 ROLL: Counters related to roll media printing

T-7-20

Display	Description	Unit
P-SQ 17-36	Cumulative print area of paper equal to or larger than 17 inches but smaller than 36 inches (physical size)	m2/Sq.f

Display	Description	Unit
P-SQ 17	Cumulative print area of paper smaller than 17 inches (physical size)	m2/Sq.f
P-CNT 17-36	Cumulative number of sheets of A4-equivalent paper equal to or larger than 17 inches but smaller than 36 inches (physical size)	sheets
P-CNT 17	Cumulative number of sheets of A4-equivalent paper smaller than 17 inches (physical size)	sheets

- MEDIASIZE2 ROLL: Counters related to roll media printing

T-7-21

Display	Description	Unit
D-SQ 17-36	Cumulative print area of paper equal to or larger than 17 inches but smaller than 36 inches (data size)	m2/Sq.f
D-SQ 17	Cumulative print area of paper smaller than 17 inches (data size)	m2/Sq.f
D-CNT 17-36	Cumulative number of sheets of A4-equivalent paper equal to or larger than 17 inches but smaller than 36 inches (data size)	sheets
D-CNT 17	Cumulative number of sheets of A4-equivalent paper smaller than 17 inches (data size)	sheets

- MEDIASIZE1 CUT: Counters related to cut sheet printing

T-7-22

Display	Description	Unit
P-SQ 17-36	Cumulative print area of paper equal to or larger than 17 inches but smaller than 36 inches (physical size)	m2/Sq.f
P-SQ 17	Cumulative print area of paper smaller than 17 inches (physical size)	m2/Sq.f
P-CNT 17-36	Cumulative number of sheets of A4-equivalent paper equal to or larger than 17 inches but smaller than 36 inches (physical size)	sheets
P-CNT 17	Cumulative number of sheets of A4-equivalent paper smaller than 17 inches (physical size)	sheets

- MEDIASIZE2 CUT: Counters related to cut sheet printing

T-7-23

Display	Description	Unit
D-SQ 17-36	Cumulative print area of paper equal to or larger than 17 inches but smaller than 36 inches (data size)	m2/Sq.f
D-SQ 17	Cumulative print area of paper smaller than 17 inches (data size)	m2/Sq.f

Display	Description	Unit
D-CNT 17-36	Cumulative number of sheets of A4-equivalent paper equal to or larger than 17 inches but smaller than 36 inches (data size)	sheets
D-CNT 17	Cumulative number of sheets of A4-equivalent paper smaller than 17 inches (data size)	sheets

**- HEAD DOT CNT.1**

Displays the counts of dots of individual colors of the currently installed print head.

**- HEAD DOT CNT.2**

Displays the cumulative count of dots of individual colors.

**- PARTS CNT.**

Displays the status of the consumable parts replacement counter.

**g. SETTING**

Allows you to make various settings.

**T-7-24**

Display	Description
Pth ON/OFF	Turns on/off the (Pth head pulse rank) control function. Default: On
RTC DATE	Set the RTC. The procedure is the same as in the user mode.
yyyy/mm/dd	The initial value is 00:00, January 1, 2006.
TIME hh:mm	* The display order of year, month, and day is defined in "Date Format".

**- INITIALIZE**

The DISPLAY histories, ADJUST settings, COUNTER values, and other parameters can be cleared individually.

**T-7-25**

Display	Description
WARNING	Initialization of DISPLAY > WARNING
ERROR	Initialization of DISPLAY > ERROR
ADJUST	Initialization of value of fine band adjustment by user and initialization of scale adjustment value The automatically adjusted value is not initialized.
W-INK	Initialization of COUNTER > PRINTER > W-INK
CARRIAGE	Initialization of COUNTER > CARRIAGE
PURGE	Initialization of COUNTER > PURGE
INK CHECK	* The refill ink usage history cannot be initialized.
INK-USE CNT	Initialization of COUNTER > INK-USE2
CUTTER-CHG CNT	Initialization of COUNTER > EXCHANGE > CUTTER EXC. Counting up of COUNTER > CLEAR

Display	Description
W-INK-CHG CNT	Initialization of COUNTER > EXCHANGE > MTC EXC. Counting up of COUNTER > CLEAR
HEAD-CHG R CNT	Initialization of COUNTER > EXCHANGE > HEAD R EXC.
HEAD-CHG L CNT	Initialization of COUNTER > EXCHANGE > HEAD L EXC.
PARTS-CHG CNT	Initialization of COUNTER > EXCHANGE > UNIT A EXC. Counting up of CLEAR > UNIT EXC.
PARTS COUNTER	Initialization of all COUNTER > PARTS CNT.

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## Chapter 8

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### **ERROR CODE**

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## 8.1 Outline

### 8.1.1 Outline

The printer indicates errors using the display and LEDs.

If an error occurs during printing, the printer status is also displayed on the status monitor of the printer driver. The following three types of errors are displayed on the display:

- Warning

Status where the print operation can be continued without remedying the cause of the problem. This can, however, adversely affect the printing results.

- Error

Status where the print operation is stopped, and the regular operation cannot be recovered until the cause of the problem is remedied.

- Service call error

When a service call error occurs, the error is not cleared and the error indication remains on the operation panel even if the printer is powered off and on again. (Occurrence of the service call error is indicated again at power-on.)

This measure is taken to prevent user's recovery of the service call error and damages to the printer.

Service call errors can be cleared, however, by starting up the printer in the service mode.

For how to take actions against warnings and errors, refer to "Troubleshooting".

#### Overview of warnings and error codes

T-8-1

Code*	Diagnosis
W100x	Ink warning
W110x	Waste ink warning
W12xx	GARO warning
03xxxxxx-20xx	Media feeding error
03xxxxxx-2Exx	Data mismatch error
03xxxxxx-25xx	Ink error
03xxxxxx-280x	Printhead error
03xxxxxx-281x	Maintenance cartridge error
03xxxxxx-282x	Adjustment error
03xxxxxx-2Fxx	Other errors
Exxx-40xx	Service call error

\* "x" stands for a numeric or letter.

## 8.2 Warning Table

### 8.2.1 Warnings

The codes correspond to the numbers shown on the DISPLAY in the service mode.

T-8-2

Code	Display message	Status
1000	Ink Lvl: Chk BK	BK ink tank is almost empty
1001	Ink Lvl: Chk Y	Y ink tank is almost empty
1002	Ink Lvl: Chk M	M ink tank is almost empty
1003	Ink Lvl: Chk C	C ink tank is almost empty
1006	Ink Lvl: Chk MBK	MBK ink tank is almost empty
1007	Ink Lvl: Chk MBK2	MBK2 ink tank is almost empty
1100	MTCart Full Soon	Maintenance cartridge is almost full
1101	Mist Full Soon	Mist count is almost full
1221	GARO W1221	Unsupported command in GARO image mode
1222	GARO W1222	Invalid number of parameters in GARO image mode (no parameter)
1223	GARO W1223	Required item was omitted in GARO image mode
1224	GARO W1224	Other warning in GARO image mode
1231	GARO W1231	Unsupported command in GARO setting mode
1232	GARO W1232	Invalid number of parameters in GARO setting mode
1233	GARO W1233	Required item was omitted in GARO setting mode
1234	GARO W1234	Data out of range in GARO setting mode
1235	GARO W1235	Other warning in GARO setting mode
100F	Feed Limit...	Force feed limit



## 8.3 Error Table

### 8.3.1 Error Code List

The codes correspond to the numbers shown on the DISPLAY in the service mode.

T-8-3

Code	Status
03060A00-2E1B	End of roll media
03010000-200A	Paper width not detected
03010000-200B	Incorrect position on platen
03010000-200C	Media leading edge not detected
03010000-200D	The trailing edge of cut sheet cannot be detected
03010000-200E	Too small media
03010000-200F	Too large media
03016000-2010	Skewed media
03130031-2F24	Cutter movement timeout
03870001-2015	Cutting failure
03010000-2017	Media right edge not detected
03010000-2018	Media left edge not detected
03862000-2E09	Roll paper running out
03010000-2E19	Media feeding error
03010000-2E1A	
03010000-2E1D	
03060A00-2E0E	Auto Roll Feed Unit not installed
03010000-2E1C	Media cannot be ejected
03180101-2E17	Cassette not loaded
03060200-201E	Job requiring cassette was received when "NO" is selected for cassette pick-up on MIT
03860002-2E0A	Manually fed cut sheet was already loaded even though received data indicated roll media
03060A00-2E00	Roll media was loaded even though the received data indicated roll media.
03861001-2405	Invalid paper position for borderless printing
03861001-2406	Data that does not allow borderless printing was received
03060000-2E14	Width indicated by received data does not match width of paper
03060200-2E03	Cut sheets were not loaded in cassette even though the received data indicated cut sheets
03061000-2E15	Media type indicated by data does not match
03060000-2E16	Media type and size indicated by data do not match (cassette only)
03060200-2E0B	Manually fed cut sheet was already loaded even though received data indicated cassette
03010000-2E1F	Too small media for internal printing was loaded
03810104-2500	No ink (BK)

Code	Status
03810101-2501	No ink (Y)
03810102-2502	No ink (M)
03810103-2503	No ink (C)
03810106-2506	No ink (MBK)
03810106-2507	No ink (MBK2)
03830104-2520	Ink tank not installed (BK)
03830101-2521	Ink tank not installed (Y)
03830102-2522	Ink tank not installed (M)
03830103-2523	Ink tank not installed (C)
03830106-2526	Ink tank not installed (MBK)
03830106-2527	Ink tank not installed (MBK2)
03830204-2540	Ink tank ID error (BK)
03830201-2541	Ink tank ID error (Y)
03830202-2542	Ink tank ID error (M)
03830203-2543	Ink tank ID error (C)
03830206-2546	Ink tank ID error (MBK)
03830206-2547	Ink tank ID error (MBK2)
03830304-2560	Ink tank EEPROM error (BK)
03830301-2561	Ink tank EEPROM error (Y)
03830302-2562	Ink tank EEPROM error (M)
03830303-2563	Ink tank EEPROM error (C)
03830306-2566	Ink tank EEPROM error (MBK)
03830306-2567	Ink tank EEPROM error (MBK2)
03810204-2580	Remaining ink low (BK)
03810201-2581	Remaining ink low (Y)
03810202-2582	Remaining ink low (M)
03810203-2583	Remaining ink low (C)
03810206-2586	Remaining ink low (MBK)
03810206-2587	Remaining ink low (MBK2)
03800100-2800	No printhead
03800200-2802	Incorrect printhead was installed
03800400-2803	Printhead EEPROM error
03800300-2801	Unable to correct printhead DI
03800500-280C	Many nozzles on printhead did not inject ink
03841201-2816	Maintenance cartridge EEPROM error
03841201-2817	Maintenance cartridge ID error
03841101-2818	Maintenance cartridge not installed
03841001-2819	Maintenance cartridge tank full
01841001-281A	Remaining capacity of maintenance cartridge is insufficient to execute each cleaning
03010000-2820	Unable to adjust printhead registration
03010000-2821	Unable to adjust band

Code	Status
03010000-2822	Unable to adjust eccentricity
03010000-2823	Printhead check error
03800500-2F2F	No ink ejection detection error
03800500-2F30	No ink ejection detection position adjustment error
03130031-2F32	Multi sensor faulty
03010000-2F33	Unable to adjust due to transparent media
03130031-2F25	Unable to detect CR motor HP
03130031-2F16	Mist fan error
03130031-2F3A	Ink supply valve motor error
03130031-2F2A	Feed roller HP sensor error
03130031-2F17	Platen fan error
03130031-2F28	Pump encode/Pump cam sensor error
03130031-2F20	
03130031-2F26	Carriage cannot operate
03130031-2F26	Carriage cannot operate
03130031-2F27	Carriage movement timeout
03030000-2E21	IEEE1394 interface error
03130031-2F22	Pump movement timeout
03130031-2F2B	Feed roller cannot operate
03130031-2F2D	Cassette cannot operate
03130031-2F23	Pump cannot operate
03130031-2F2E	Roll movement timeout
03130031-291B	Lift movement timeout
03130031-2E23	Cutter unit failure
03130031-2F13	A/D converter external trigger output stopped
03130031-2F14	Unable to write in ASIC register

## 8.4 Sevice Call Table

### 8.4.1 Service call errors

Codes correspond to the numbers shown on the DIPLAY in the service mode.

T-8-4

Code	Description	Display message
E141-4046	Recovery system rotation court reached 50,000.	ERROR Exxx-xxxx Call For Service
E144-4047	Feed system counting error	
E146-4001	Borderless/idle ejection/mist recovery count full	
E161-403E	Abnormally high printhead temperature	
E196-4040	Checksum error	
E196-4041	Flash memory clearing error	
E196-4042	Flash memory write error	
E196-4043		
E196-4044	EEPROM size error	
E196-4045	EEPROM write error	
E198-401C	RTC error	
E198-401D	RTC low battery error	
E198-401E	RTC clock stopped	

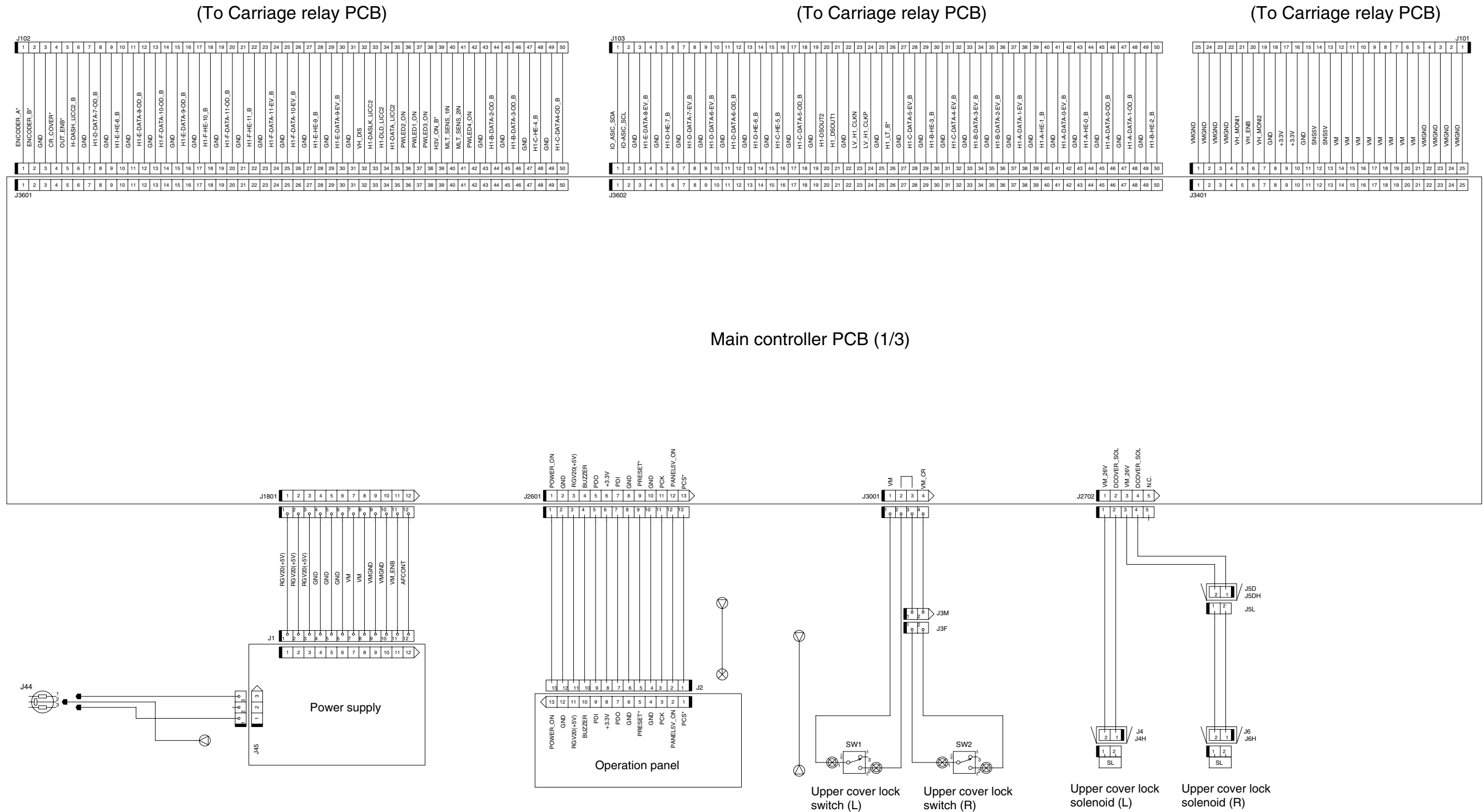
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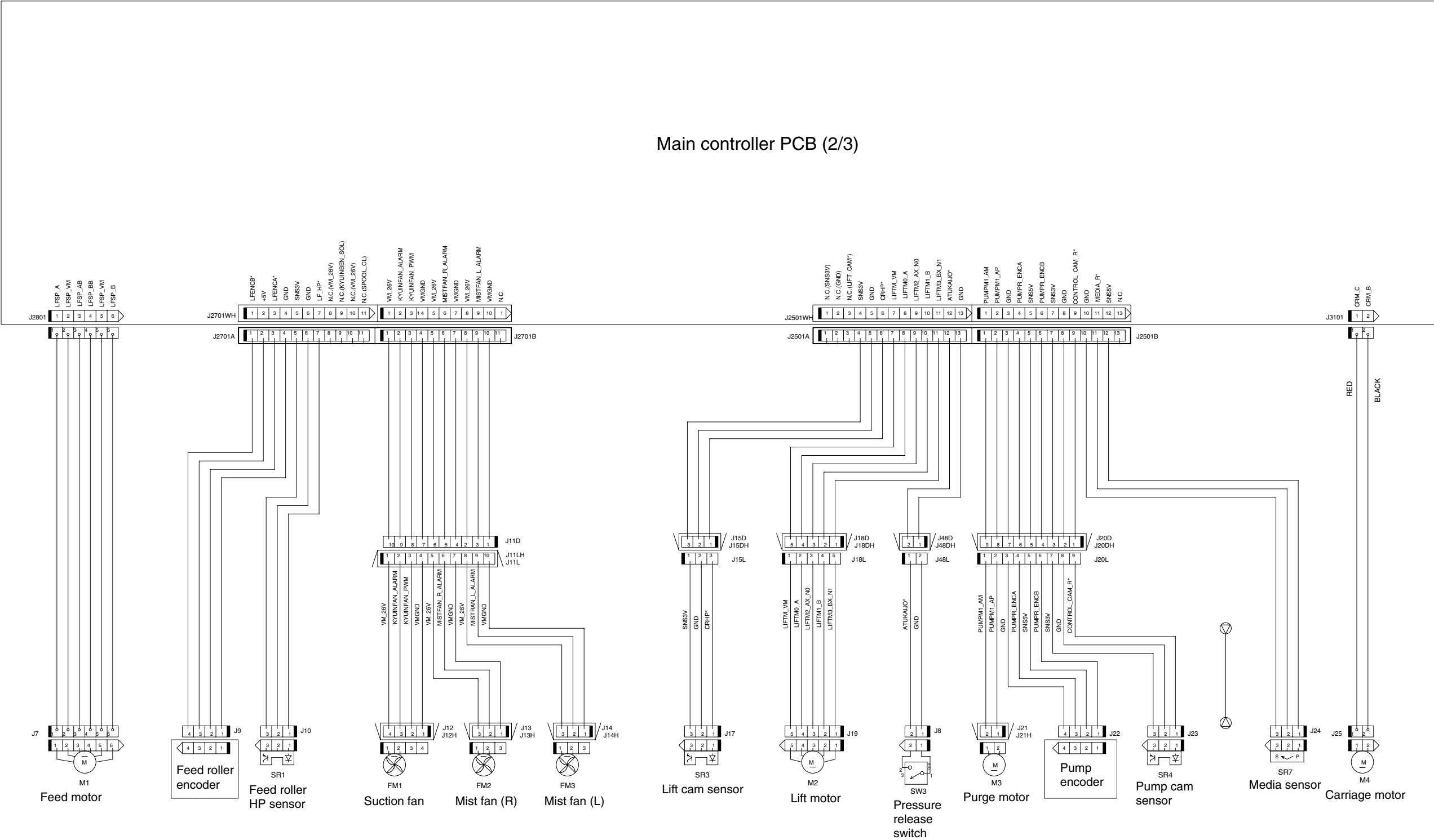
# APPENDIX

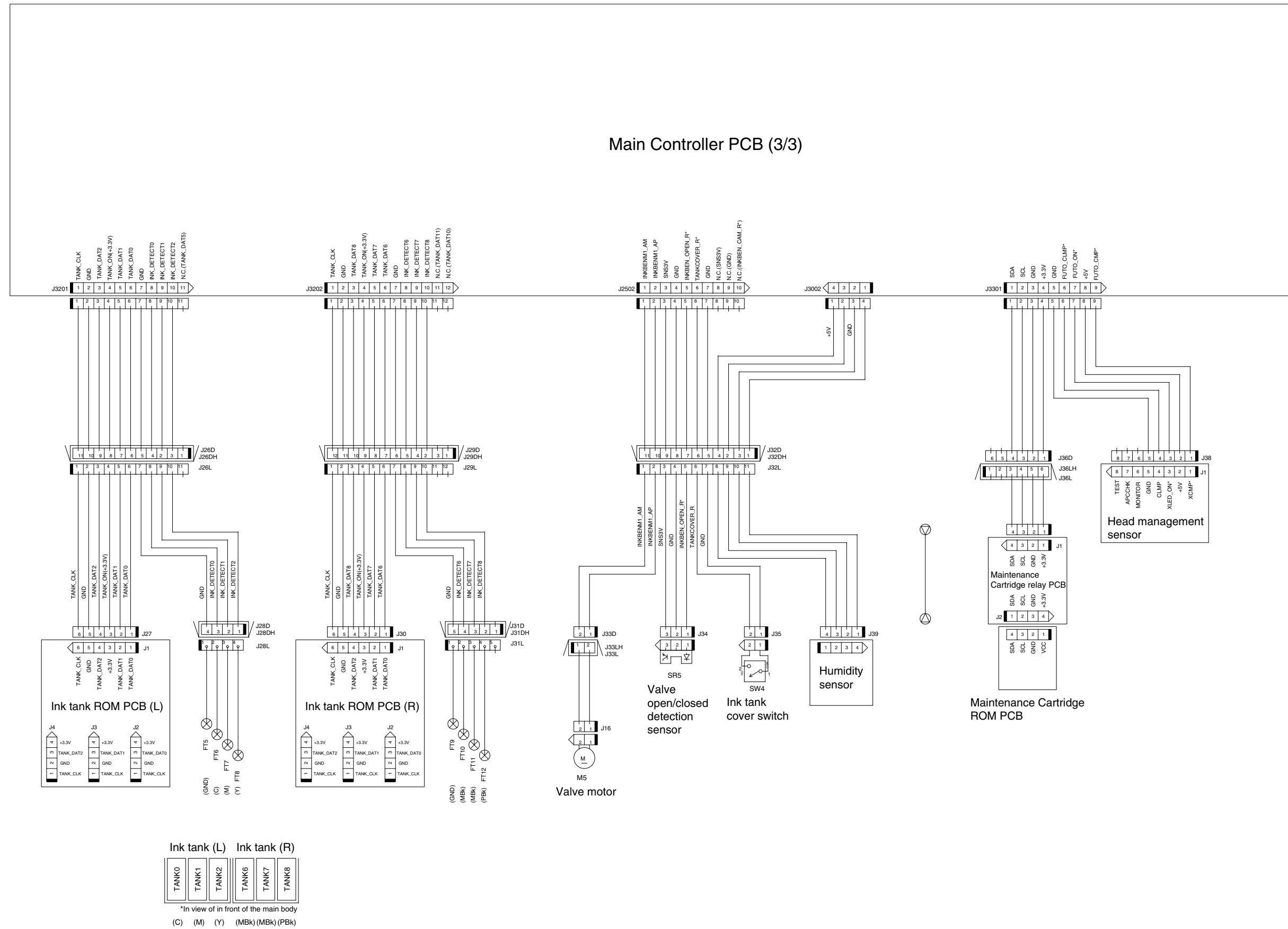
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# 1 General Circuit Diagram

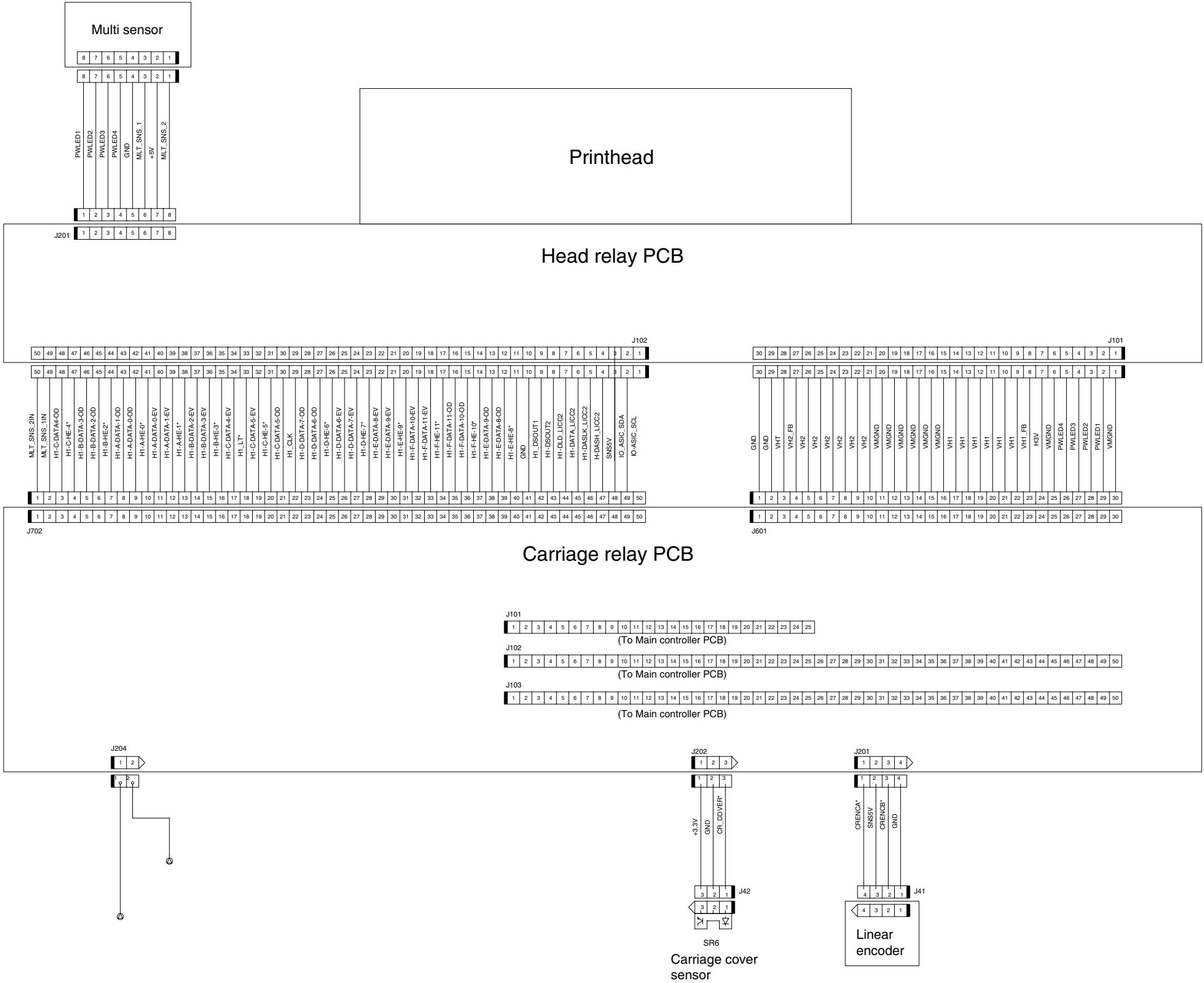
## General Circuit Diagram (1/4)











F-1-4

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